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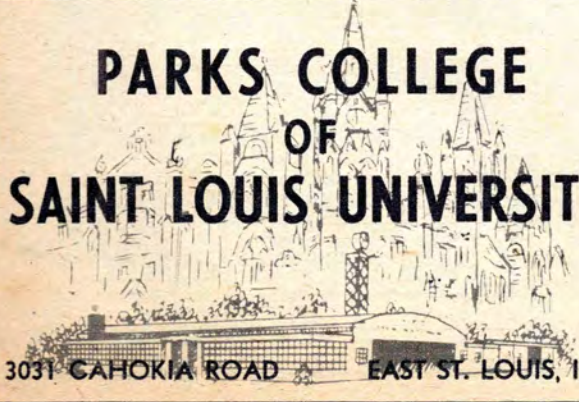

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AIR TRAILS

MAR., 1951 • VOL. XXXV, No. 6

All communications to the Air Trails editorial offices should be addressed to Air Trails, 304 East 45th St., New York 17, N. Y.

IN THIS ISSUE:

Cover	Zboyan	1
The Woman's Angle	Nonie Horton	10
Light/Sail Plane Parade		12
Airmen of Vision		14
Air Notes		16
The Navy Fighter Is Best!	Robert McLarren	21
Development Highlights		24
Air Progress: Development of the Military Plane	Doug Rolfe	26
Mr. Sikorsky and the Helicopter	Wm. S. Friedman	28
Job in Aviation: Flight Instructor		29
Helio Two		30
Ahead of His Time	Frank Tinsley	31
Air Adventurers Club		34
Nameless Passenger	George Gardner	36
Crowbar "56"	Ray Matthews	37
Dope Can	"Dopester"	41
Petit Pete	Bernard O. Beck	42
Hot off the Wire	S. C. Smith	44
Bill Barnes' Amphib Fighter		45
Vought F7U Cutlass		48
Wakefield: Shape of Things to Come		50
MIG 15 Russian Jet Fighter		51
Motor of Month: Spitzy		52
Model of Month: Lift Master		54
Sketchbook		56
Western Round-up	Dick Everett	58
Plan Form of Future Wakefield Model	Frank Ehling	60
Showcase		84

• AIR TRAILS published monthly by Street & Smith Publications, Inc., at 122 East 42nd St., New York 17, N. Y. Entered as second class matter at the post office at New York, N. Y. Authorized as second class mail, Post Office Dept., Ottawa, Canada. 25c per copy—$2.50 per year. $7.50 per year in countries of the Pan-American Union; $3.00 per year in Canada; $10.00 per year elsewhere.

• Please advise us if you move; allow four weeks for change of address. Give old and new address when notifying us.

• Subscription correspondence should be addressed to Subscription Dept., Street & Smith Publications, Inc., 304 E. 45th St., New York 17, N. Y.

THE READERS WRITE:

Popular in Japan . . . You will be interested to know that I purchased my last copy of Air Trails in Hongkong. I have noticed Air Trails at many places during my Oriental tours and can assure you personally that it is enjoying great and growing popularity in Japan.

Dallas B. Sherman, Regional Director—Orient, Pan American World Airways System

Hey, Betty! . . . My very first impression upon reading the article by Betty Skelton, "Girl vs. Airplane," was to tell Miss Skelton that she need not play second fiddle to anyone, much less to an airplane.

If Miss Skelton will pardon my getting personal, I think she is the nicest thing that has happened to aviation for a long time. She is very cute, just the way I like my women and I'm sure I'm not the only male to think so. Her proportions would certainly interest me more than those of the airplane.

I follow aviation, have been building model airplanes for some years, and yet I still have the normal male appreciation of things. According to Miss Skelton I am in the possible minority. I hope not.

If she will be so good as to fly to Baltimore, my home town, I will be more than happy to buy her a hamburger, to say the least. I realize the article was written as a satire (I hope) but then, a little reassurance never hurt any woman's ego.

I'm for you one hundred percent, Miss Skelton!

Bruce Packham, Univ. of Md., College Park, Md.

Draftings of Thompson Trophy Winners . . . I am very interested in obtaining exact three-view drawings and photographs of all the Thompson Trophy Race winners. At present I have several sets of plans for some of the planes but they differ so widely in configuration that I don't know which ones to use. I would sincerely appreciate your help in putting me on the track of some accurate drawings containing three-views, cross-sections and airfoils of all the winners suitable for producing exact detailed models of these planes.

Roger A. McIntyre, Columbus, Ohio

• We believe you will find what you want in "National Air Race Sketchbook," by Buehl and Gann, published by Floyd Clymer, 1268 South Alvarado St., Los Angeles 6, Calif. The price is $2.

Anybody Seen a Midget? . . . In reading over the Dope Can I noticed Mr. Davis' letter about the AT Cruiser. I built one and installed an OK .049, then second flight—O.O.S. That was over a month ago and it hasn't been found yet.

I also have a beef about AT, otherwise a darn good mag, but the midgets are cluttering up the joint. It has been many an issue since I've seen a model for the so-called popular B engines, scale or semi-scale preferred.

Jim Moses, Elmore, Minn.

Flying Wing Kits? . . . I would like to know where I could obtain a kit for a flying wing using a Class A engine (with a pusher propeller).

I like Air Trails very much because it started me on my model airplane building hobby.

Michael Volow, Kings Park, N. Y.

• Sorry, we know of no flying wing kits.

Pleasant Idea . . . For years the people who build model airplane engines such as Ohlsson & Rice, McCoy and many others have built only two-cycle engines which use expensive fuels. What I want to know is why somebody doesn't make a four-cycle engine than can run on car gasoline.

John Stankavich, Renton, Pa.

• Far too expensive.

A Stamp Pal . . . I read the letter in "The Readers Write" saying you give the stamps on mail from overseas to service men in a VA hospital near New York. I used to collect foreign stamps myself but gave it up after a while. So enclosed are some foreign and U. S. stamps to be sent to service men in the hospitals and would you let me have some of their names and addresses so I could get a few pen pals to write to.

Wayne Janicki, Sharon Springs, N. Y.

• Anybody on this roster anywhere is invited to answer the request.

Approved by Headquarters . . . The "Link Instructor" story . . . in your magazine is a good one . . . Your series about jobs in aviation is one that will be of value to both teachers and the youth of our country. Guidance in the field of aviation can stand shots in the arm like this. Keep it up.

Philip S. Hopkins, Vice President, Link Aviation, Incorporated, Hillcrest, Binghampton, N. Y.

Cadet Fever . . . I am fifteen years old and an enthusiastic model builder. As I am a freshman in this hobby, I would appreciate any suggestions you can pass along to me on the following topic.

For about a year I have had in my possession two miniature gasoline engines, a McCoy 29 and a Cub 74, with airplanes to suit, the Key for the .29 and the Key-det for the .74. This is my problem. Having invested a considerable amount of money in these projects, I find myself afraid to try to fly these airplanes. What should I do?

Bob Leahy, 122-24 Lucas St., St. Albans, N. Y.

• Model builders aren't afraid of anything! On the constructive side, will some more experienced members of model clubs in Bob's vicinity contact him and help check him out on that solo?

Different Kind of Drawing . . . I'm afraid this is the last drawing I'll be able to do for AT for a long, long time.

Al Johns, Los Angeles, Calif.

• We salute *you*, Cartoonist First Class Johns!

To Enter the Nats . . . I think your mag is by far the best in planes, also it is a help to us youngsters. But there are a couple of things I would like to know. What does "jettisonable" mean? And a friend told me you have to fly and win in another contest to enter the "Nats," but I disagree. Can you set us right?

Pat Keating, Yankton, So. Dak.

• The National meet is open to anyone with an A.M.A. license who can pay the nominal entry fee. "Jettisonable" as applied to aircraft means that a part, usually an external wing tank, can be dropped in flight.

(*Continued on page 9*)

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T-28 N.A. Trainer 30" B. C.	4.95
Taylorcraft 35" A.B.C.	2.95
Topper II 16" A-B	2.25
Trail Blazer 24" B-C-D	2.95
Veco 6" 3p, 4p, 7" 4p, 8p, 8" 5p, 6p, 9" 6p, 7p (6"—25c; 7" & 8"—30c; 9" & 10"—35c)	
Also Ohlsson, Tru-Torque, Garday	

RUNNING & TEST BLOCKS

E-Z Running Stand	1.25
Universal Running Blocks	1.50
Wright Test Block (Lgn.)	4.95
Wright Test Block (Glo)	2.50

METAL GAS TANKS

Dale Stunt Tanks—All Sizes .65

#1—1½x1½x⅝	#4—4½x1¼x⅝
#2—2¼x1½x⅝	#6—1½x1½x1
#3—2¼x1¾x1	#12—4½x1x⅝
#15—2¼x1½x¾	

Froom: 1¼x1¼ or 2 hor. or ver. .50
1¼x1¼x2 Sq. .80
1¾x ¾x2¾ Wedge .80
1¼x1x2⅝ ½-Rnd Stunt .80

FLYWHEELS

A & R—1.00; C & D 1.50
DeLuxe 3-16" shaft—1.25; 1/4" shaft—1.50; 5/16., 3/8" sh. 1.75

IGNITION COILS

Aero Featherweight	2.50
Aero Qual. 3.60	Regular 1.50
Arden 2.50	Rogers 2.00
O.K. 1.50	Wilco 1.95
O.K. Twin 3.50	Winston 2.00

Smith: Competitor — 1.95, Firecracker 2.75—Dual 4.50

CONDENSERS

Regular — .20 Smith Metal .35

SPARK & GLO PLUGS

Arden Glo (V2 or V3)	.65 & .85
Arden AA	.49
Champion Glo V, V2, V3	.75
Champion V, V2, V3, VR1, VR2	.50
Infant Glo-plug (spl)	.65
McCoy Hot Point	.65
Ohlsson Glo (V, V2 or AA)	.65
O.K. Glo-plug (V2 or V3)	.49
Plug washers	.05

IGNITION ACCESSORIES

6 ft. Hook-up wire	.25
Alligator clips	.10
Arden Booster Jack	1.25
Austin Booster Plug-in	.30
Midget Switch: slide—.25 Turn	.50
Ohlsson Snap-Pack	.35
Arden Battery Cord Kit	.35

PROP SPINNERS

Adapter Nuts (state eng.) .20

⅝"—20c; 1¼"—	.65
1½"-85c; 1¾"-90c; 2"-.95, 2½"-1.00	
3" Needle Nose 1¾" dia.	1.15
2"	1.20
Plastic 1½"	.50
Scamper Plastic 1¾", 1¾", 2", 2¼"	.45

WHEELS

Semi Pneumatic (pr) 2"	.95
2½" — 1.10, 3"	1.50
Sparky Tail Wheel Assembly	.25
Sponge Rubber, Dural hub (pr)	
⅞"— 25c, 1.1¼"-25c; 1¼", 1¾"-.35	
1⅞"—50c, 2¼"	.65
Sponge Rubber, Wood Hub (pr)	
2"—40c, 2½"—50c, 3½"	.60
Tail Wheels ⅞"; 1¼"	.15
Trexler Pneu. (pr) 1¼" or 1½"	.40
1¾", 2"—50c; 2¼", 2½"—60c; 2¾"	1.00
3"—1.25; 3½"—1.50; 4½"	1.75

FLIGHT TIMERS

Austin metal	1.50
D-E Shut Off Valve	1.00
Elmic (gas. or glo)	1.85
Hillcrest plastic	1.25
Stutter-off Valve	.75

A.A. ACCESSORIES

Shut-off Valve (state engine)	.55
E-Z Minimount	.85
.004 or .006 x 2—35	.35
.006 x 2—½"	.50
Spinners (state engine)	.60
Presto Starter (state engine)	.25
Prop (state engine)	.75 to .95
Tanks (state engine) .50, .60, .75	
Neoprene (ft)	.15
Fuel Meter	.50

MISCELLANEOUS

Batt. Box Pen. and Medium reg.	.40 .50
Brass Tubing 1/16", 3/32", 1/8"	.20
Coil Holder	.15
Copper Tubing ⅛" OD, per ft.	.20
Finger Guard	.40
Fuel Line Filter	.35
Fuel Pump .65 & .69	
Metal Motor Mounts, Sm—39c; Lg.	.50
Metal Pump Can .75c & 1.50	
Needle Valve Exten. flexible	.35
Neoprene Tubing, per foot	.30
Transparent (reg. or AA) ft.	.15
No. 10 oil, 3 oz.—25c; pint	.90
Plastic Fuselage 19" set of 2	.50
Plug Wrench, 3-way—15c; 4-way	.25
Plywood (6"x12") 1/32"	.20
⅛" 1/16"—25c; 1/8"—30c; 1/4"	.35
Silk per yard	1.50
Silkspan, light 18"x24" (white) heavy 24x36" (white)	.05 .10
Red, Blue, Yellow 24"x20"	.10
Socket Plug Wrench, 4-way	.50
Soldering Set	2.25
Spinnet Starter	5.00
Tngue (most colors) 36"x24"	.05
Universal Needle Valve Flexible	.50 .75
Vibratac	2.00

BURIED IN THIS AD

are most of the new items. Sometimes there isn't time or space to clude them. But, if available,we have it.

Trixter Babe 20" AA	1.25
Trixter Invert Jr. 40" A-B	3.95
Trixter Profile 32" A-B	2.50
Trixter Profile 38" B-C	3.50
Trixter Twin Profile 47" B-C	5.00
Tuckette 38" C-D	3.95
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Wee Willie 18" AA-A	1.95
Whirlaway 11" AB	3.95
Whirlwind Sr. 30" B-C-D	7.98
Wildfire 22" B-C-D	1.95
Wing Ding 18" AA-A-B	2.00
Wing Dingus 16" AA	2.00
Yank 23" AA	1.50

ACCESSORIES

FUELS (Continental U.S.A. Only)

For Ignition	Pts	Qts
Ohlsson #1 #3	.75	1.40
Power Mist #6	.65	—
Reg. Pink	—	1.25
For Glo		
Ohlsson #2, #4	.75	1.40
Ohlsson AA	.75	—
Ohlsson #2 or #4 Econ.	.50	—
Powermist Glo	.90	—
Powermist Spitfire	—	1.55
Ranger Glo	.80	—
Red Devil	.60	1.10
Testors 39	.75	—
Dynaglo	.75	—
Ranger AA	.80	—
Spitfire AA	.80	—
Blue Blazer #1	.65	—
Blue Blazer #2	.75	—
OK Cub	.75	—
For Diesel		
Drone	—	1.00
Ranger (Fixed Head)	1.00	—
Ranger (variable head)	.85	—

Pouring Spout For pint cans .10
Hot Fuel Proofer .25, .35 & .45

PROPELLERS

Rite Pitch Stunt 8, 9, 10, 11, 12, 13, 14 in., 6 and 8 pitch .35
Rite Pitch 8, 9, 10, 11, 12, 13, 14 in., 6, 8, 10 or 12 pitch .35
Scamper Plastic 5½" 3p, 25; 9" 6p .45 10" 10p, 11" 8p .65
Super Spl. 8", 9", 10", 11"in 6 & 8" p. .25

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.008, .010, .012, .014 2-70'	.65
.018: 2-150'	1.00
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Berkeley Metal Flight Reel	1.25
Berkeley Metal Handle	1.00
Elevator control horn .10; Veco	.25
Elevator hinges 4 for	.10
E-Z Plastic Control Handle	.85
Instant-Use Handle, 5 or 6"	.50
Luxon Clips A, B, C or D Pr.	.10
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.010, .012, .014, .016, .018, .020 dia. 2-70' lines	.65
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Reel Pal Reel	1.95
Simplex Handle & Reel	1.50
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Tommy Handreel	1.75
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Veco Bellcrank .20 &	.25
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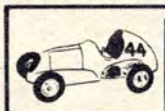

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25c: Tiger Shark P40, Globe Swift, Taylorcraft, N.A. Mustang, Helicopter, Navion, Firefly, Cricket, Jupiter, D7 Fokker, Spad, Phantom Fury, Aeronca "K", Stinson SR-7, Bluebird, Aircomet, Piper Cub

50c: Doug Daunt, Sup. Spitfire 1X, Grum. A'ger TBF-1, Corsair F4U-1, Vultee Ven. A-35, Piper Cub, Ercoupe, Dipper, Skyrocket, Stratus, Sparky

$1.00: N.A. Mustang 24", Doug A-26 30", Thunderbolt 24", Wildcat F6F 24", Lightning P-38 34", Clipper, Jr. 36", Pepper 32", Taylorcraft 54", Aeronca 54", Piper Cub 40", Gull 42"

ENTERPRISE 18" 50c: Piper Cub Special, Taylorcraft, Aeronca Champion, Monocoupe

AIRLANE 25c: Cessna 170, Stinson Voyager, Taylorcraft, Piper Cub, Beechcraft Bonanza, Aeronca

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Jasco Special 1.50, Jasco R.O.G. 35c, Jasco Kid 50c, Jasco Jr. 85c, Jasco Sr. 1.25, Thermalier 1.50, Thermal Cruiser 1.50

SCIENTIFIC (27"-30") 50c: Atlantic Ace, Skipper, Yellowbird, R.O.G. Bullet

25" at 35c: Royal, Major, Bantam, Ranger

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MONOGRAM 75c: Speedybuilts: Cessna Seaplane, P51 Mustang, Spad Pursuit, Republic Thunderbolt, Ryan Navion, Hellcat 6F6, Piper Cub, Aeronca, Monocoupe, Ercoupe, Boeing Kaydet, Midget Mustang

ALSO: 28" Prowler or 31" Pirate 1.25

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DISPLAY - AIRPLANE

COMET (8"-9") 25c: Aeronca Sedan, Cessna 170, Piper Cub, Taylorcraft, Luscombe Sky Pal, Stinson Voyager

CAVACRAFT 50c: Mustang, SE5, Piper Cub, Ercoupe, Taylorcraft, Navion, Cessna

OLIN PLASTIC (½" scale): Shooting Star 1.00, Piper Cub 50c, Stinson 50c, Seebee 1.00, Beechcraft Bonanza 75c, Jet Sabre 1.00, Ercoupe 50c, Ryan Navion 75c

STROMBECKER 59c: Piper Cub Super Cruise, Piper Cub Super Sea Scout, Swift Land, Swift Sea

69c: P80, Shooting Star, Beechcraft Bonanza, Douglas Skyrocket, Douglas DC3 Flagship

79c: Convair Flagship

1.19: Northrop P61, Douglas DC6 Flagship

1.89: Liberator

3.00: Super Fortress B29

DYNA-MODEL: P6F, P51, P8F, F4U, P40, F.W. 2.75, P38 3.50, P47 2.98

HAWK PLASTIC: F84 Constellation, S6B 1.00, Gee Bee, Curtis, Ike, Laird 50c Gruman Panther 1.50, Mr. Mulligan 1.00

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(Continued from page 4)

Cover Needed . . . A request has come into the Library for pictures of planes such as appeared on your June issue. Unfortunately your magazine is so popular that the cover is no longer usable. I would appreciate it if you would send me a duplicate cover.

(Mrs.) Miriam H. Brennan, Librarian, Queens Vocational High School, Long Island City, N. Y.

No Plans? . . . Wha' hoppened to your fine plan service? Just as I was about to write you to compliment you on the excellent service I've been getting each month on my plan orders the service suddenly falls off. Come, come . . .

P. K. Cunningham, Queens Village, L.I., N.Y.

• Our apologies, PK, to you and all other plan purchasers. Combination of circumstances; first the printer who turns out the plans closes down his plant for employees' vacation, then our offices move from Elizabeth, N. J., to NYC, then the wildcat rail strike comes along and ties up mailing of printed matter. Everything was cleared out of our offices prior to Christmas. Hope you have a merrier New Year with good plan service from AT. And, incidentally, modelers, if you want fast delivery on your plan orders you may include 9¢ for first class mailing, or 18¢ for airmailing *per plan ordered.*

They're Separate Now . . . Those full-size plans you used to have in the magazine as a long strip of paper were very good. Let's have some more. I like your coverage of all the big meets. Keep it up.

Richard Bogue, Denver, Colo.

• Sorry about the "accordion" fold-out plans. Postal authorities nixed the idea.

Wanna Join? . . . We of the newly formed club T.L.O.C.L.F.C.S.C. (the Loyal Order of Control Line Flyers Cuss at Spectators Club) have a few suggestions to make: 1. (If you're flying with skis.) Put rudders on the bottom of your skis, to keep them running straight. 2. Never run to keep your lines tight when there is snow on the ground or you will find yourself with your plane in a snowbank, take it from us, we have found out already. 3. When everything seems to go wrong, quit! (Something's bound to happen.)

Anyone not knowing too much about models interested in joining our club should do so as they will be among their own kind. Contact me as follows—

Phillip Hughes, 1716 Elliot Ave. So. Minneapolis 4, Minn.

Claude Confesses . . . In a recent issue you re-ran a photo taken at the Dallas Nats and asked the identity of the launcher, previously labeled by mistake as Claude McCullough. Well, I'm the guy, test-hopping my red, white and blue Triumph .49-powered "hybrid" in front of the workshop hangar. It has a Comet Sailplane wing and tail on my own box fuselage.

I remember that flight particularly, because even though it was sprinkling my plane stayed up so long after a short motor run. That concrete apron apparently had a lot of residual heat being radiated. I had my binoculars around my neck just in case, after hearing tall tales of Texas thermals.

This "Claude" also is monkeying with radio control, having several nice flights on a modified Hoosier Hot-Shot.

Bob Lange, Madison, Wis.

Sailplane Plans . . . In the Airmen of Vision section of AT for December, I found a sailplane in which I am interested and would like to purchase plans for same if possible.

If not, I would appreciate learning where I might obtain a catalogue of sailplanes with approximate cost estimates and specifications.

F. W. Moran, RCAF Station, Chatham, N.B., Can.

• No plans are available for the sailplane referred to. It was just an idea for a high-performance ship by one of the country's outstanding soaring pilots. For catalogue of sailplanes, we suggest you write to the Schweizer Aircraft Corp., Elmira, N. Y. They are the only sailplane manufacturers in the United States.

They will be glad to help you.

Annual Woes . . . I have my Air Trails Model Annual for 1951 on order at my local newsstand and I am waiting with crossed fingers for it. I was in the Army when your 1944 and '46 Annuals came out and didn't get them. I finally bought the 1943 issue from a friend. I would like to know of any possible means of obtaining the '44 and '46 issues. I want to make my collection complete.

How about it?

Norbert E. Rhodes, Williamsburg, Pa.

• We regret that past issues of the AT Annual are no longer in stock. 1951, of course, is now on sale. But don't let anybody borrow it!

Spitfire Colors . . . I am just finishing a model of a British Supermarine Spitfire. Can you tell me how to paint it if it were about to take part in resistance of the Nazis during their "softening up" of England?

Since every other detail is correct, I want the colors to look like the real thing too.

Joseph Cairo, Philadelphia, Pa.

• The camouflage of the daytime Spitfire fighter consisted of irregular patches of dark green and dark sea-green on the upper surface of the wing and fuselage down to its belly, while the entire undersurface was painted a pale grey.

The Woman's Angle

The gals are destined to play an important part in the accelerated air mobilization program, says NH

■ In times of national emergency the big, immediate problem that stares the nation in the face is manpower. In World War I, and even more so in World War II, the great industrial analysts came up with a heretofore-undiscovered source and solution to this problem—womanpower.

It was good figuring, but it was no accident. The smart boys reviewed the jobs held by women in the first war; and the kind of jobs some have held since. They came to the conclusion that women could be used in any department or job as long as the jobs were not beyond their physical strength (570/1000 of that of man), and resistance (679/1000 of that of man), and did not require lengthy training—which an "emergency" never permits, anyway. They found, also, that women were good at instrument-building, at small, light, intricate items. They were good at "worrying the metal" (the trade term for machinery parts), using gauges, micrometers, and vernier calipers.

So—they got the gals close to the flight line. The aircraft industry had eight subdivisions: airframes, gliders, special purpose aircraft, engines, propellers, sub-contractors, parts suppliers, and modification centers. The airframe plants, as you know, assembled fuselages, wings and tail fabrication on their own and subcontractors' premises. They also installed engines, propellers, instruments and accessories necessary to complete the airplane for delivery.

Well, they got Miss and Mrs. America into the defense plants and war-implement industries. "Rosie the Riveter" became the symbol which represented the thousands of average American civilian women who worked in these industries for as long and as hard as they were needed.

By the time the year 1943 rolled in, 500,000 gals were "in" the production of airframes, engines and props—40 percent of the entire labor force in airframe plants and approximately 30 percent in engine and prop-plants were women. Since they were unskilled in metal-fabricating at first, the assembly-line technique speeded things up. They were soon able to deliver high-speed production combined with exact machining and close tolerances required by automatic, constant speed, controllable-pitch props. To the great surprise of the industry, the gals made the curves on the production graphs rise, made a new niche in the job-extension programs, made the industry give additional advanced training.

The gals were working on everything from BT-13's (Vultee Vibrator) to Lightnings, Mustangs, B-17's and B-24's. There were even three major plants that had more *women* than *men* on the payroll!

Here's a breakdown of the jobs that were filled by gals by the end of 1943:

1. Machine Operating: *a.* Drilling, reaming, countersinking on single and multiple drills, and pneumatic drills. *b.* Small milling machines. *c.* Small turret lathes. *d.* Small and medium-sized punch presses. *e.* Small angle-bending machines and brakes. *f.* Light grinders. *g.* Riveting and dimpling machines. *h.* Spot welding.
2. Bench Work: *a.* Burring and filing of all kinds. *b.* Soldering. *c.* Hand-forming over templates and blocks. *d.* Tube-cutting, bending and assembly. *e.* Electrical assemblies. *f.* Wiring and bending. *g.* Sub-assemblies in jigs and at benches.
3. Hand and machine sewing of covers and fabric assessories.
4. Stretching of covers on plane surfaces.
5. Doping.
6. Painting—spraying of small parts, stenciling, applying decals, masking, etc.
7. Racking in paint, heat treating, anodizing and plating.
8. Detail inspection of parts and sub-assemblies.
9. Departmental factory clerks and assistants in planning, parts control, blueprint dispatching and drafting.
10. Tool-room attendants.

In the aircraft instrument manufacturing outfits:

1. Assembly benchwork: *a.* Mechanical sub-assembly. *b.* Special assemblies—diaphragms, gyro motors, autosyn-electric motors. *c.* Closing of instruments.

2 Testing and Inspecting (which they could do if trained or "upgraded" from instrument assembly operations): *a.* Parts inspection. *b.* Calibrating. *c.* Electrical tests. *d.* Cold, vibration, and run tests. *e.* Final instrument inspection.

If "Rosie" wished to go on and acquire higher skills, she was permitted to participate in plant-training programs—such as on-the-job (*Continued on page 55*)

About the Author (shown above), Nonie Horton, hardly ever called Leonora, who has been flying for 10 years . . . has racked up 3,500 hours in all manner of planes . . . from Piper Cubs to wartime B-26's . . . holds commercial, instrument, instructor, single & multi-engine, land & sea ratings . . . in last war volunteered for service with WASP's . . . currently holds rating of 1st Lt. in USAF Reserve . . . started flying as a hobby . . . excellent aerial photographer . . . has done extensive test piloting.

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LIGHT SAIL PLANE PARADE

With the country preparing itself for full military strength, speculation is rife as to the place soaring will hold in the scheme of things. During World War II thousands of military glider pilots were trained and thousands of troop-carrying gliders built and put to use for transportation of troops, artillery, prime movers, field engineers and wounded. Gliders participated in such major undertakings as the invasion of Sicily, Operation Ladbroke, invasion of Normandy, action at Arnheim and the Rhine in Europe, and the famous Operation Broadway out on the Pacific front; not counting a number of smaller sorties.

They did their job and did it well, but at best their history is not a very happy one. Outside of the Rhine action, losses were pretty high. Thus of 133 gliders in Operation Ladbroke, 47 landed in the sea; during Operation Broadway, only 32 landed at destination, though 67 were dispatched. Arnheim was almost a major catastrophy, and we had to withdraw. The entire procedure of launching a large quantity of gliders is somewhat complicated and fairly lengthy, exposed to enemy attack.

It is interesting to note that the Germans, who were first to use gliders militarily, abandoned big-scale use of them after the invasion of Crete, switching to large-capacity slow-flying airplanes capable of landing and taking off from small and rough fields. Their standby was the famous three-engined Junkers Ju 52/3m, and later they introduced the giant Messerschmitt Me 323 six-engine 181-foot-wingspan transport capable of carrying 130 fully armed troops. This ship was actually a motorized version of the Me 321 glider.

After the war our own military strategists, looking back on the experience with gliders, came to the conclusion that powered air transports with landing and take-off characteristics comparable to those of a motorless craft are much more flexible carriers, having a much greater spread in speeds. Starting first with motorized gliders, known as PGs or PIGs, adaptions of the Waco CG-14s and 15 and the Chase CG-18A, the design gradually emerged into a specialized craft known as Assault Transports, examples of which are the Chase C-122, C-123 and the Northrop C-125. These are the type of craft which will take the place of the troop carrier gliders in the future wars.

Germany, though having abandoned gliders as transports, did not throw them out of the military window completely. At the end of the war they had definite plans for and experimented with the use of specialized short-span sailplanes for primary training of future jet and rocket plane pilots.

It might be pointed out that the Germans did not consider this program from the standpoint of economy alone, but were planning to incorporate the soaring experience itself. Though the reason may appear obscure to some, the idea had soundness when one considers the fact that a rocket plane expends its fuel in around 8 minutes, becoming, from then on, a glider with a heavy wing loading. The Germans knew, long before us, that rising air currents exist in the stratospheric heights where the rocket plane operates, this lift being the result of atmospheric waves formed under certain meteorological conditions. Though most frequently encountered in mountainous regions, it has been observed over flat ground as well. The upward surge of such waves is sufficiently powerful to support easily a heavy aircraft. Taking advantage of this condition, a rocket plane pilot can maintain his altitude and even climb without the use of power, thus considerably extending duration of his flight. It would not be surprising that the Germans had this in mind when adding soaring to their proposed training.

Here in the United States, the role that sailplanes can play in certain military operations has not been entirely disregarded, either. Altitude records of over 30,000 feet established in the last two years at Bishop, Calif. on the crest of atmospheric waves decided the military establishment, and the university of California, to underwrite an upper-atmosphere research program known as the Sierra Wave Project, using sailplanes. It will be run by the Southern California Soaring Association.

Thus, gliders may have no role at all in front-line warfare, but instead become meteorological research labs for hi-flying jet fighters and guided missiles whose path leads them through the extreme turbulence occasionally found in the stratosphere and which, properly understood, can be made a useful ally. Soaring pilots have proved this.

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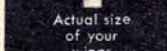

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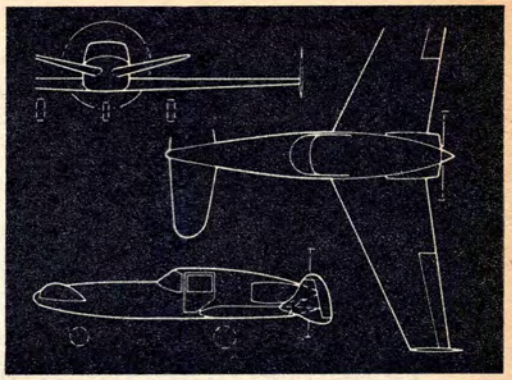
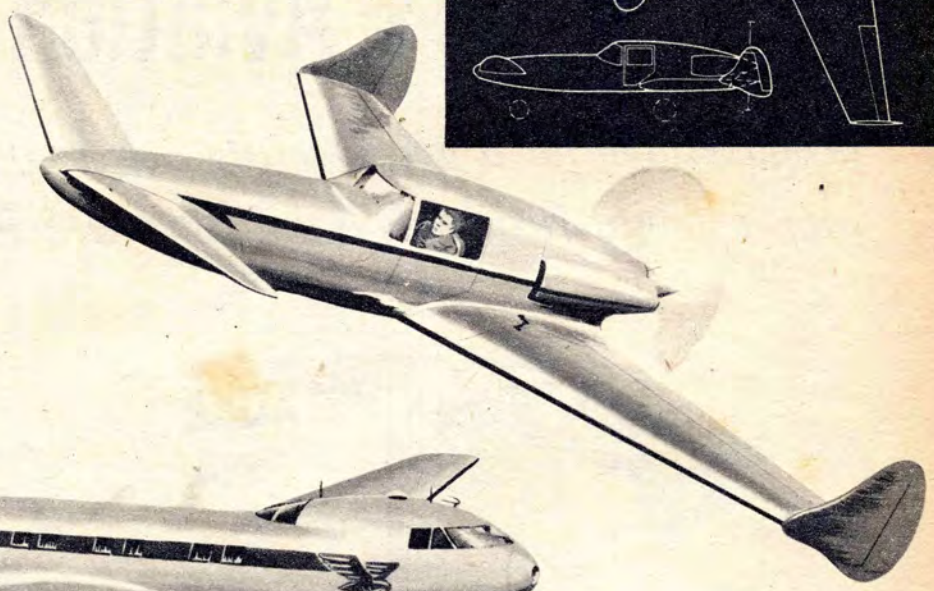
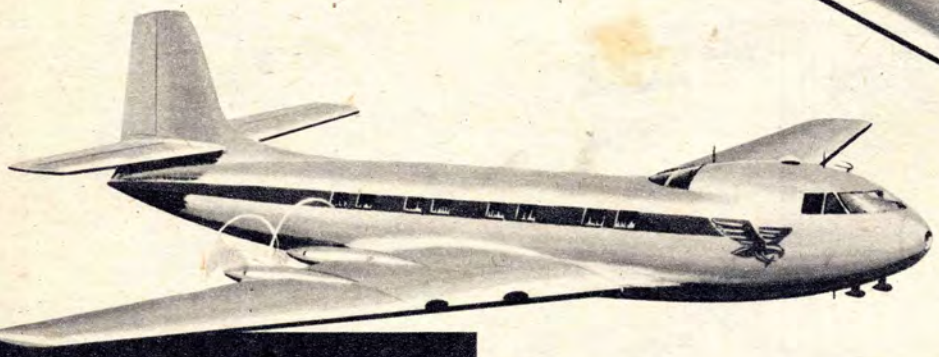
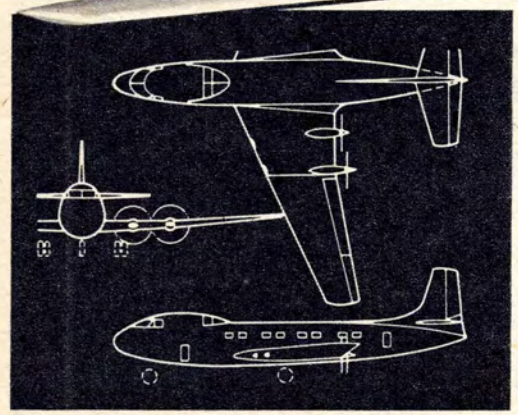


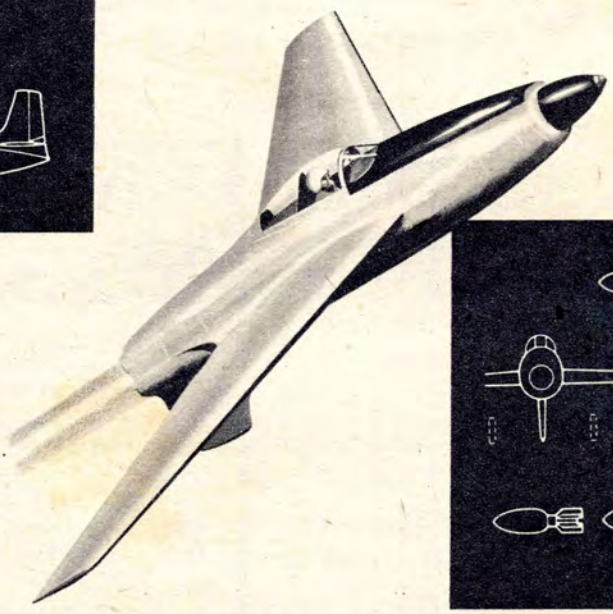
George W. Dunbar of Nashville, Tenn., is in front this month with original canard personal plane design. It is spin and stall resistant as the forward surfaces will stall ahead of wing. Lateral and yaw control are by means of ailerons and rudders at wingtips. Entire forward surfaces are movable, serving as elevators. Plane is all metal, carries two, has large baggage allowance. Span 30 ft., top speed 190 mph.



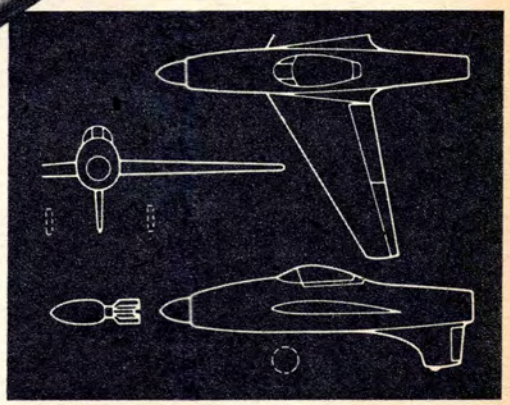




Second honors go to Philip de Carolis of Astoria, N. Y., for his design of interesting turbo-prop transport. Built-in, hydraulically operated steps. Crew compartment raised for better visibility and comfort. Span 112 ft. Cruising speed 405 mph.



The Jolly Roger, a very intriguing interceptor by Walt Holmes of Dubuque, Iowa. Carries a rocket shell in opening of the nose which also serves as air intake for jet engine after the rocket is fired. Prior to that, propulsion is furnished by a rocket engine. Inboard control surfaces on trailing edge of wing are elevators; outboard, ailerons. Span 24' 7½", top speed 850 mph.



Air Trails has opened its columns to those who are interested in presenting plans for "aircraft of the future." Rules governing the competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8½ x 11 inches for the entire three-views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and judges. The designs may be of any type: commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of $25. Payments of $5 will go to the runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that because of large number of entries they cannot enter into correspondence on A. of V.

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BIG JOB for engineers was inspection of completed 57-foot-high tail fin on Air Force's XC-99 Consolidated Vultee transport, world's largest land plane ...an example of the interesting and varied duties performed by aeronautical engineers.

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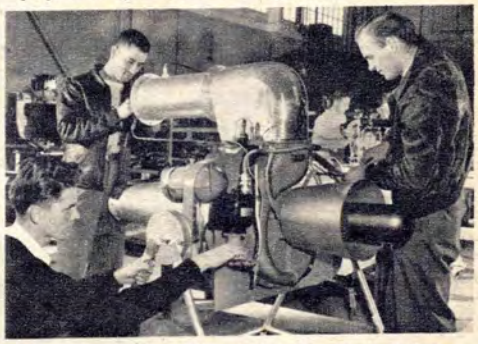

As a practical training project, Northrop engineering students developed this lightweight turbojet aircraft engine by adapting a fighter plane turbosupercharger, the students themselves designing and building the combustion chamber, ducts, tail pipes, and electric controls.

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Northrop student engineers consult on dual control arrangement for student-designed and built private plane. Complete metal mock-up shown here was fabricated and assembled by students as part of practical training project.

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air notes | AVIATION TODAY AND TOMORROW

Air Bearings. Friction, an old enemy of all things mechanical, has been licked in certain components of guided missiles produced by North American Aviation, Inc. Heretofore, ball, needle and other type bearings took partial care of the bugaboo. Now comes the N.A.A. invention, "air bearings" lubricated by a film of air 1/1000th of an inch thick which eliminates all starting friction. How does it work? Air is forced into the bearing race through tiny capillaries drilled to 1/3,000th of an inch in diameter. A shaft mounted on air bearings will turn at the touch of a feather and will continue turning long after a similar shaft, mounted on conventional bearings, has stopped due to friction.

Lonesome Polecat. That's the name of the Boeing B-29 of the 375th Strategic Reconnaissance Squadron located near Fairbanks, Alaska, which recently, with its crew, has completed its 375th flight over the North Pole. These round trips, covering 4,000 miles, have been flown every day for the past three years by the squadron. They serve primarily to observe weather and record atmospheric conditions between the base and the North Pole.

Shake 'Em Up. Jet planes fly so smoothly that such gear-operated instruments as the altimeter, the airspeed indicator, and rate of climb indicator and others act erratically and lag because there is not sufficient vibration to overcome gear friction. To correct this "error" and make the gauges perform properly, Safe Flight Instrument Corp. of White Plains, N. Y., has devised a vibrator to be installed on the jet plane instrument panel to put the shake into it. This condition was well known by glider pilots, who used to mount devices like electric door buzzers on the instrument boards of their sailplanes.

Last of the A's. North American Aviation, Inc., has completed deliveries of the F-86A Sabre jet fighters to the U.S. Air Force and is starting production on the latest version, the F-86E. The new model, though basically the same as the "A," features an "all flying tail" wherein the stabilizer is linked to the elevators for coordinated movements. Thus the entire horizontal tail surfaces are movable. This eliminates the loss of effectiveness of the surface due to heavy air loads at extreme high speeds.

Westland-Sikorsky. The Westland Aircraft Ltd., Yeovil, England, has acquired rights to manufacture the 10-place Sikorsky S-55 helicopter. Inasmuch as the S-55 requires an engine of higher power than those installed in British helicopters, and a suitable engine is not available at present from British sources, Westland intends to continue using the 600 hp Pratt & Whitney which powers the S-55 until a British powerplant of same power becomes available. The Westland concern is in production, at the present time, on the smaller S-51 four-place helicopter, built under Sikorsky license.

Brags From Behind the Iron Curtain. Communist Russia has been making all kinds of preposterous claims as being the first in this and that. According to the Kremlin a gent by the name of Yablochkin invented the dynamo and the electric bulb long before Edison thought of it. Another character named Mozhaisky flew an airplane at least ten years before the Wright brothers. And now Iron Curtain aviation magazines are proudly displaying early Soviet aircraft hailing the brilliance of their designers. It doesn't require an eagle eye to recognize some of the craft as the DeHavilland DH-4, DH-6 and Bristol fighter. Later claims state that Russia was the first with flying wing planes. And what do you suppose the craft shown was? No less than the erstwhile Northrop XP-79. Great to-do is made over the first giant bomber, the Sikorsky Ilya Mourometz.

In order to fool the citizens into believing the accomplishments of the Communist regime, the Kremlin is bragging about the achievement of the men whom they would have gleefully hanged and shot back in 1917 because they were loyal citizens of the Imperial regime, not to mention gross plagiarism of designs which never had a start in the land of Russia.

New Model. Consolidated Vultee Aircraft Corp. has started production of a new model of the famous Convair-Liner. Designated the 240-A, the plane has an increased gross weight from 41,790 lbs. to 43,575 lbs. It will also be powered by two new Pratt & Whitney CB series engines rated at 2,400 hp each. The basic structure will be designed to accommodate turbo-prop engines when they have been service tested and available for airline use.

Comfort for B-36 Crews. Extra-long missions running into 30 and 40 hours, now possible with B-36 bombers, have made crew fatigue problems more acute than ever before. Realizing this, Consolidated Vultee Aircraft Co. and the Air Force have been working for some time on a project to relieve crew fatigue. The giant bombers will soon be equipped with such items as a good-size galley complete with electrical burners, ice box and storage space, lightweight retractable tables and folding chairs, to eliminate eating on catch-as-catch-can basis; extra bunks in forward compartment, instead of nylon hammocks, with mattress, pillow and blankets and two new lavatories equipped with hot water, wash basin and shaving mirror.

More DC-6Bs. A contract for the purchase of seven latest type 365 mph Douglas DC-6B airliners has been recently signed by the Dutch air transport company, KLM. The planes are expected to be in the airline's service early in 1952.

European Thunderjets. The Republic F-84E may be built overseas by Italian and French aircraft plants under license as part of Mutual Defense Aid Plan.

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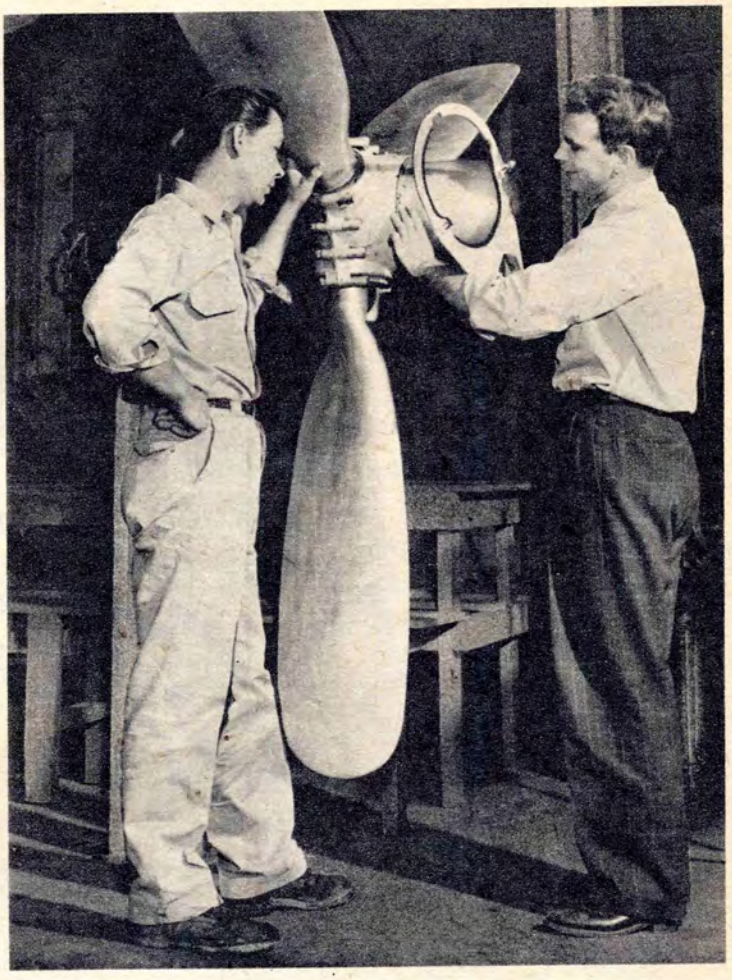

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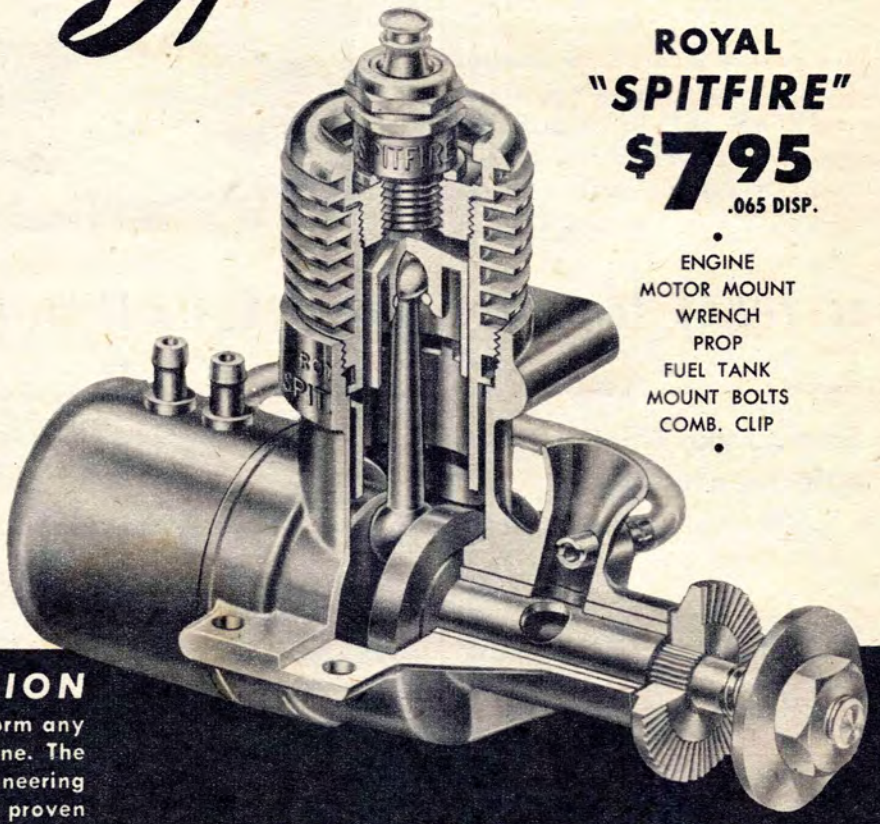

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AIR TRAILS
MAR., 1951

The Navy Fighter is Best!

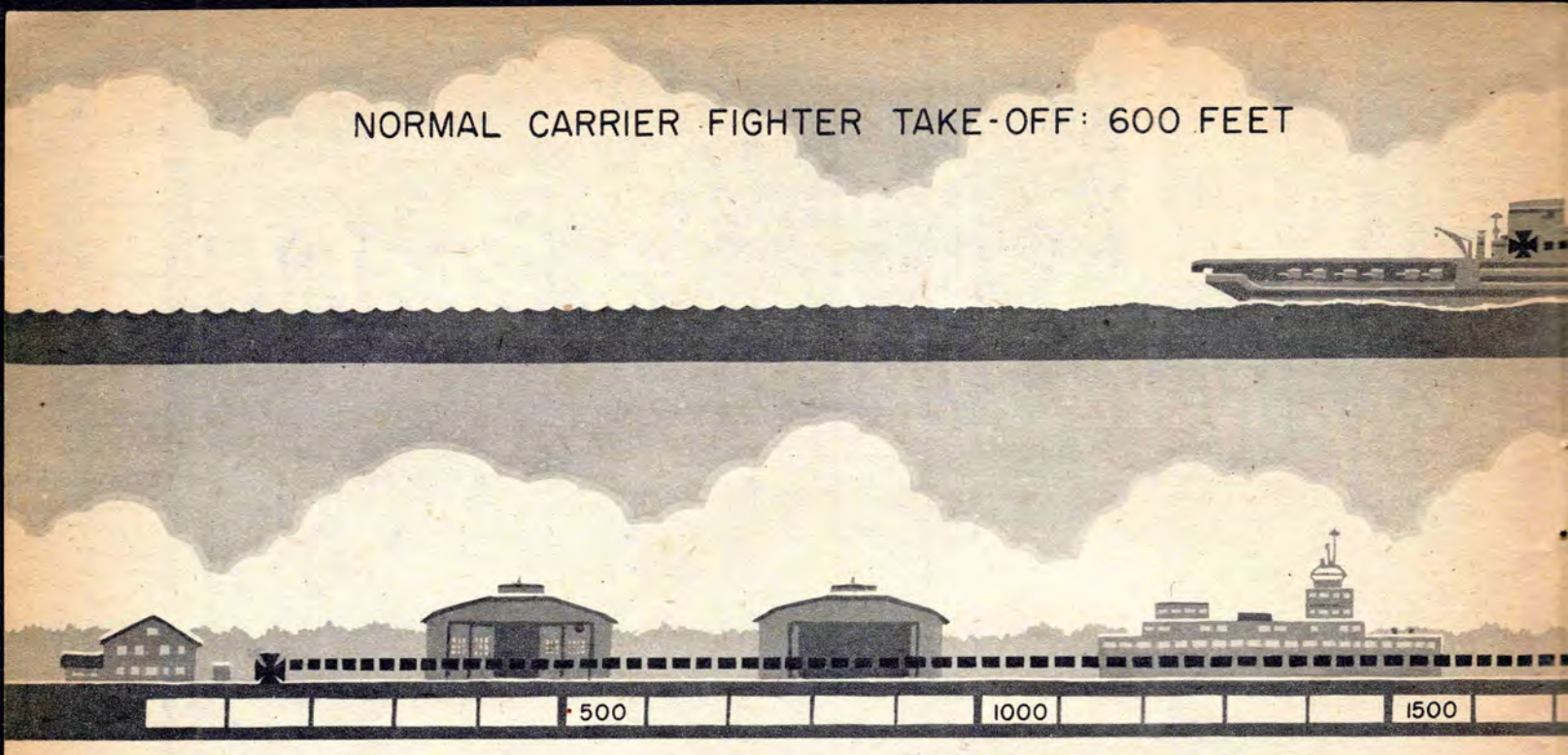
■ The Navy carrier-based jet fighter is the most potent defensive weapon in this nation's aerial arsenal. A sweeping statement? Sure it is—but here are the facts and figures to prove it. These data were compiled on the basis of officially released information; there are no military secrets here, believe it or not!

The chart on page 23 is a complicated maze of curves and intersections that looks like a crazy patchwork quilt, but if you'll come along this jigsaw puzzle while we thread our way slowly and carefully through it, you'll see why the Navy fighter is the best defense we've got against atom-laden Russian bombers.

Aircraft performance estimation is a complicated business, and if you think the chart is involved you should have seen the sheaves of papers used in its preparation. Into such calculations must go lift and drag coefficients, equivalent parasite areas, L/D ratios, span loadings, parasite loadings, span efficiency factors (both straight and swept wings), velocity and thrust ratios, *et cetera*. But all these complex formulas and ratios can be reduced down to two simple parameters that permit all aircraft to be compared qualitatively at least, and that's all we're interested in here.

The first of these is wing loading, which is simply the gross weight of the airplane divided by its wing area, giving

By ROBERT McLARREN



the number of pounds each square foot of wing must lift. Obviously, the more weight each unit of wing area must lift, the more power that is required to move it through the air. Just to give you a familiar framework of reference it might be pointed out here that the wing loading of the Piper Cub is about 7 lb./sq. ft., that of the Bell X-1 supersonic research plane is 100 lb./sq. ft. All the airplanes we're going to discuss lie somewhere in between!

The second of these parameters is power loading, the gross weight of the airplane divided by the available thrust of the turbojet engine, giving the number of pounds of airplane that each pound of thrust of the engine must propel. The less this ratio, the faster and better-performing is the airplane.

Let's take our first look at the chart now and see how Navy and Air Force jet fighters compare on the basis of these two ratios. The abscissa (horizontal line) of the chart is the wing loading of the various fighters shown, and these increase toward the right. The further to the right your airplane is located, the higher is its wing loading. You'll note that there is a sharp dividing line between the Navy fighters (indicated by the squares) and the Air Force fighters (indicated by the circles) at about 55 lb./sq. ft. The Navy fighters generally lie to the left of this loading, indicating that they have lower wing loadings than the Air Force fighters, which generally lie well to the right of this dividing line.

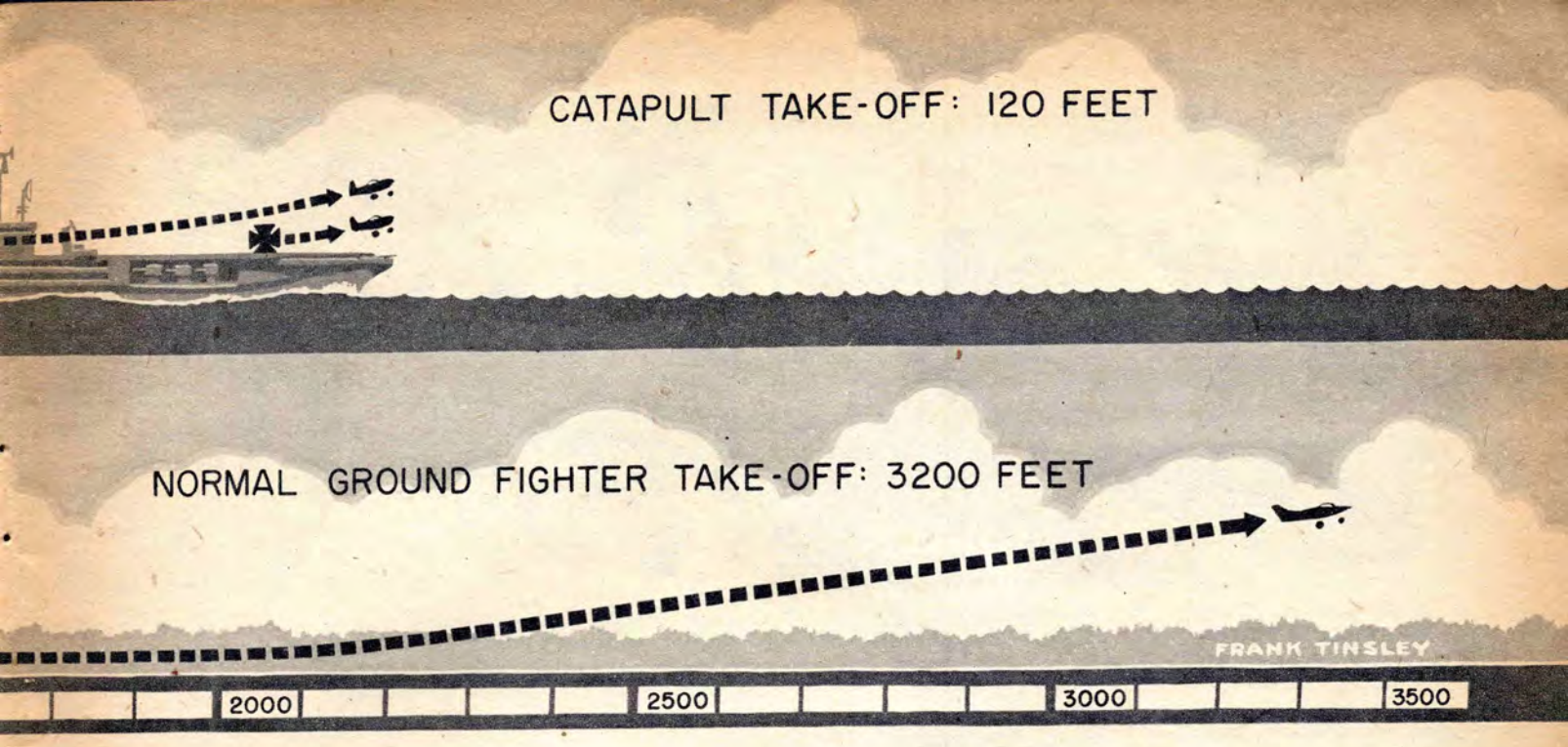
It is easy to see why this is so. The Navy plane must operate from the restricted deck of the aircraft carrier; the latter's runway is 500-900 ft. long, while the Air Force runway is 5,000-10,000 ft. long. The first argument advanced by the anti-carrier man is that this limited deck length puts a crimp in the Navy airplane which forever prohibits it from matching the Air Force fighter as a weapon. BuAer (Bureau of Aeronautics) engineers like this one, because it's so easy! Their answer: the things that must be done in the design of an airplane to make it a successful carrier plane are the very things that make it a superior all-round fighting machine!

The usual criticism is leveled at the short take-off distance available to the Navy plane. What these critics don't know is that since late in World War II take-off has been absolutely no problem to the Navy pilot. All Navy jet fighters are now catapulted off the carrier deck, attaining a speed of 150 ft./sec. in just over two seconds along a distance of only 150 ft., which requires an acceleration of only about 2½G, and not the 10-12G often claimed necessary. With two deck catapults in operation, which is usually the case (the *U.S.S. United States* super-carrier was to have four deck catapults), a complete jet fighter squadron of 18 aircraft can be launched in 4½ minutes.

This is to be compared with the 12 minutes required for a land-based jet fighter squadron to get airborne—and minutes are precious things in interception work. That 7½ minutes saved by the carrier launching means 75 miles in distance in the air, which is about radar detection range for standard service units!

The carrier jet fighter design problem is not take-off, it is landing aboard the carrier. This isn't nearly so tough as you might think. First of all, the carrier steams into the wind which gives the jet fighter a 30-40 knot headwind to start with. He can make his approach at the usual 100 mph and still touch down at only 60-70 mph relative to the deck. If there's a wind at sea of say 10-20 mph, then his actual landing speed is further reduced to only 40-60 mph, and that's getting down to Cub figures.

However, the designer has got to assume there is no wind and that his airplane is going to hit the deck at a full 100 mph or less. Landing speed is reduced by high-

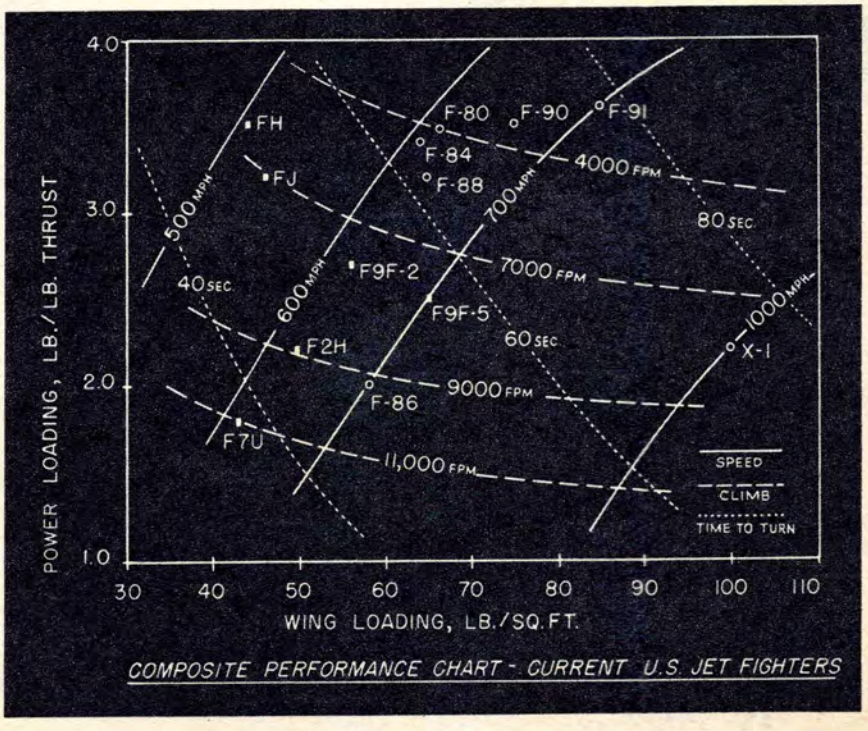


lift devices (such as the nose flaps on the Grumman F9F Panther, the landing flaps on all modern fighters), by high-lift wings themselves and by low wing loadings. All of these things also shorten take-off and improve lateral control. It is for these reasons that the Navy carrier jet fighter has its low wing loading as compared to its land-based counterpart.

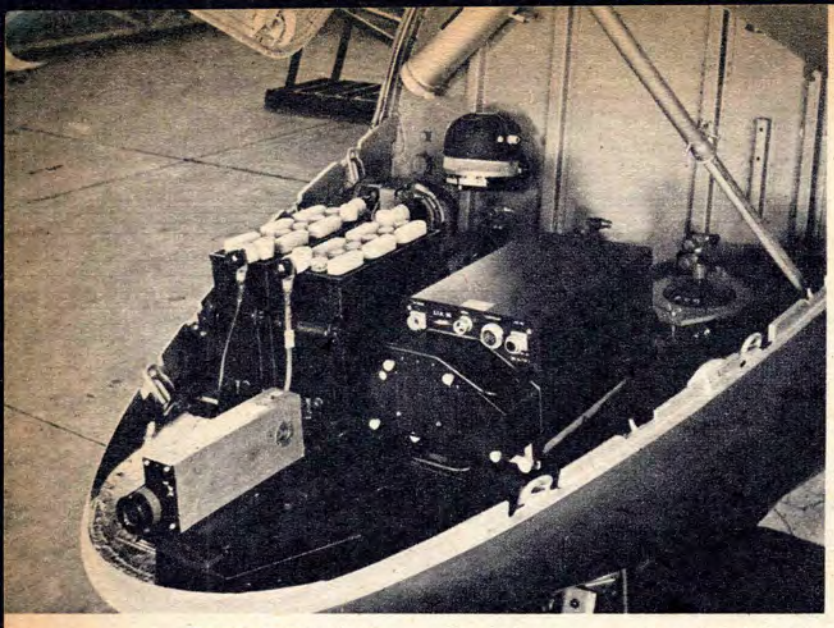
If we now look at the ordinate (vertical line) of the chart, we'll see that both Air Force and Navy fighters are pretty well scattered up and down the figure on the basis of power loading. The important point here, however, is not where the airplane falls on the power loading scale as such. The vital consideration is the *combination* of low wing loading with low power loading. This is a difficult design problem. Low power loading can be obtained by simply cramming bigger and bigger engines into an airplane, but this makes the weight go up and, therefore, the wing loading. The thing to look for here is how close the airplane comes to the lower left side of the chart—and notice how the Navy airplanes are generally located down in this region, with the Air Force fighters drifting way upward toward the right!

The first thing we'll dispense with is speed. The layman's assessment of a fighter is always concentrated in one brutally simple question: "How fast will it go?" If that was the pertinent question, the answer would be so easy: the Bell X-1 is the world's fastest airplane and, with guns, would be the hottest fighter in the world. But did you know that at its maximum speed of just under 1,000 mph it would take the X-1 a distance of *eight miles* to simply reverse its direction, during which time it would travel 25 miles through the air? That's hardly the kind of maneuverability that wins sky battles, and this explains why the X-1 is now in the Smithsonian Institution and not in vast squadron service ready for action.

Yes, the Air Force fighter has it in speed. If you'll look at the gently sloping curves going upward and to the right, you'll notice that they are lines of equal speed; that is, all aircraft lying along one of these (*Continued on page* 72)



COMPOSITE PERFORMANCE CHART - CURRENT U.S. JET FIGHTERS



Camera gun, battery, radio and oxygen equipment installed in the nose of the British Vampire jet trainer shown at right center. Excellent accessibility is attained by hinged nose cap.

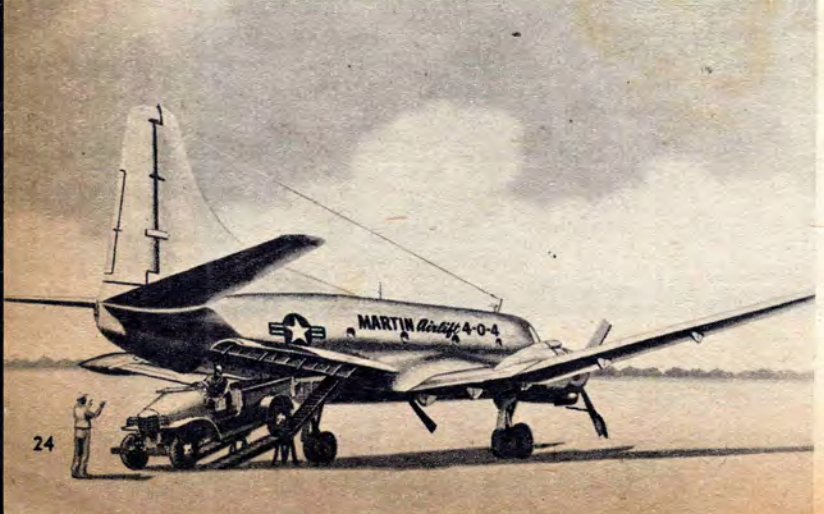
Cockpit of Vampire trainer seats two side by side. Has duplicate set of instruments and two gun sights, jettisonable hatch, and is pressurized. Maximum speed is 530 mph at 40,000 feet altitude.

Starting jeep. This three-wheeler converted from a standard jeep by O. A. Szekely & Associates, carries starting equipment for jet engines. Very maneuverable and suitable for use on carriers.

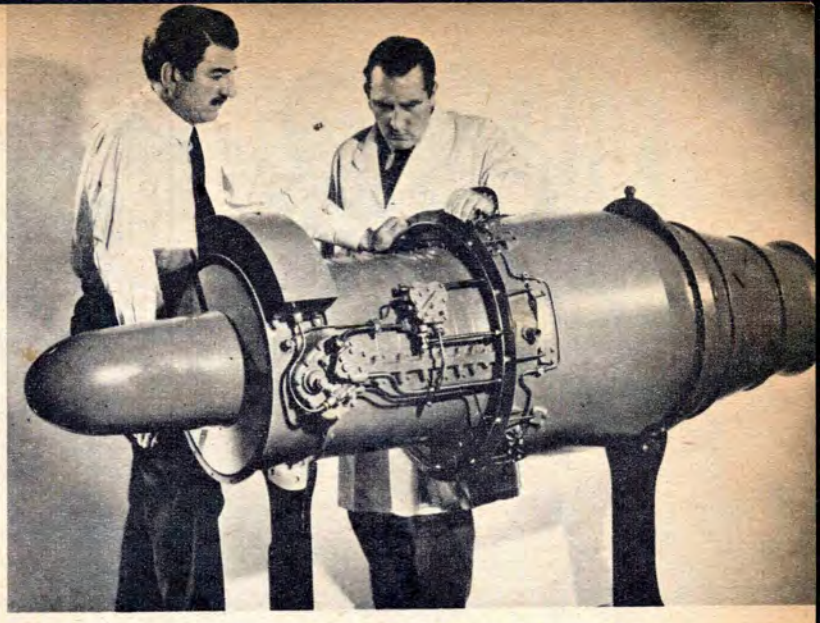
Development Highlights

Airlift 404 military cargo transport design one of which was recently turned over to the AF by Glenn L. Martin Co. Note large clamshell doors and ramp for loading of motor vehicles.

Wing tip tanks on the Airlift 400 will considerably extend its range. Preliminary specifications call for 15,000 lb. payload over combat range of 1,500 miles at 270 mph. Engines: 2500 hp P&Ws.

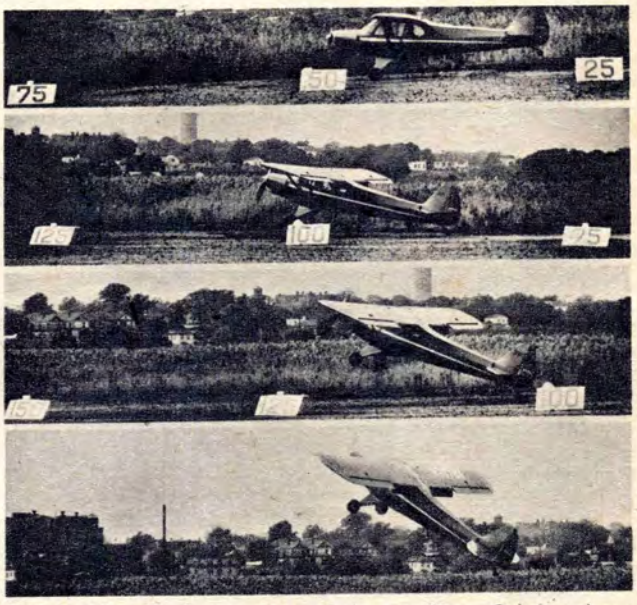


Convair Turboliner readied for test flight. Plane belongs to the Allison Co. and will be employed to test the 2,750 hp Allison 501 turbo-prop engines for use in the passenger air transport field.



Armstrong Siddeley Viper, small British turbo-jet engine specially designed for pilotless radio-controlled aircraft. Measuring only 20 in. in diam. and weighing 400 lbs., it develops 1,500 lbs. thrust.

Fouga Cyclope. Acrobatic and training sailplane powered by a Turbomeca Pimene jet engine. Plane is smaller than the model which flew in Miami last year. Span is 28.7 ft. Top speed 280 mph.



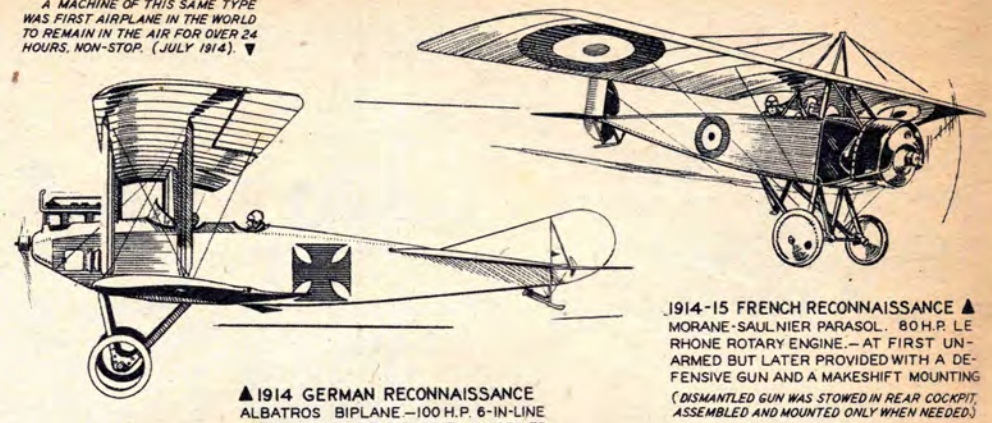
Quick take-off characteristics of the new Super Cub are demonstrated here. Plane climbs steeply after a 100 ft. run. Performance obtained by starting with flaps up, lowering them after 50-ft. run.

Spherical visor of green transparent plastic gives jet pilot good vision and prevents crash helmet from flying off in the event of high-speed bail-out. Was developed by the Air Materiel Command.

Tri-Pacer. Companion to the 1951 Piper Pacer is this tricycle gear airplane, which goes into production in March. Nose wheel is steerable through rudder pedals. Rudder and aileron are interconnected.

AIR PROGRESS

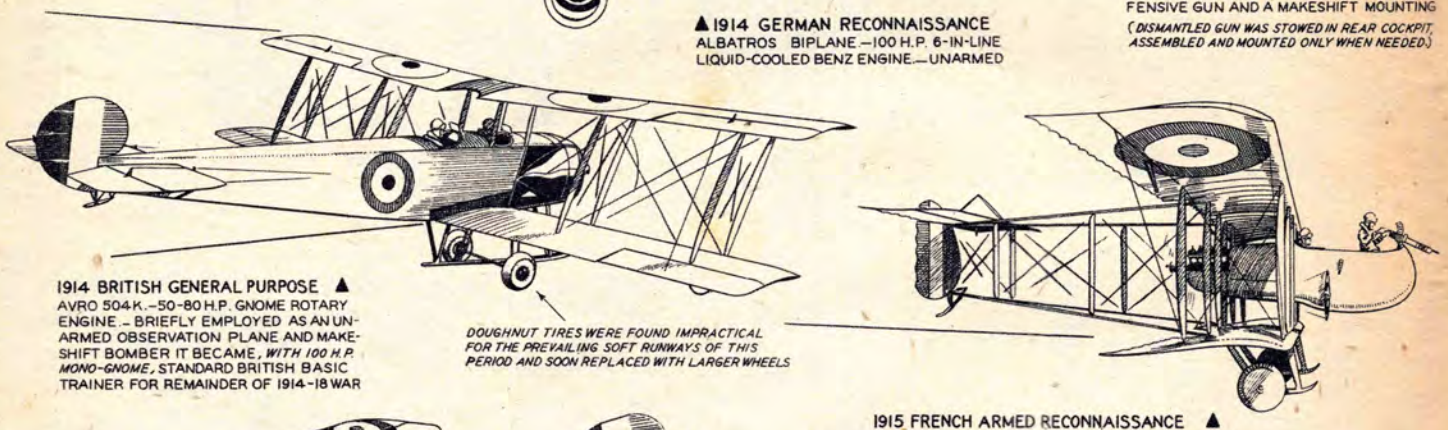
By DOUGLAS ROLFE



A MACHINE OF THIS SAME TYPE WAS FIRST AIRPLANE IN THE WORLD TO REMAIN IN THE AIR FOR OVER 24 HOURS, NON-STOP. (JULY 1914). ▼

1914-15 FRENCH RECONNAISSANCE ▲
MORANE-SAULNIER PARASOL. 80 H.P. LE RHONE ROTARY ENGINE.— AT FIRST UNARMED BUT LATER PROVIDED WITH A DEFENSIVE GUN AND A MAKESHIFT MOUNTING
(DISMANTLED GUN WAS STOWED IN REAR COCKPIT, ASSEMBLED AND MOUNTED ONLY WHEN NEEDED.)

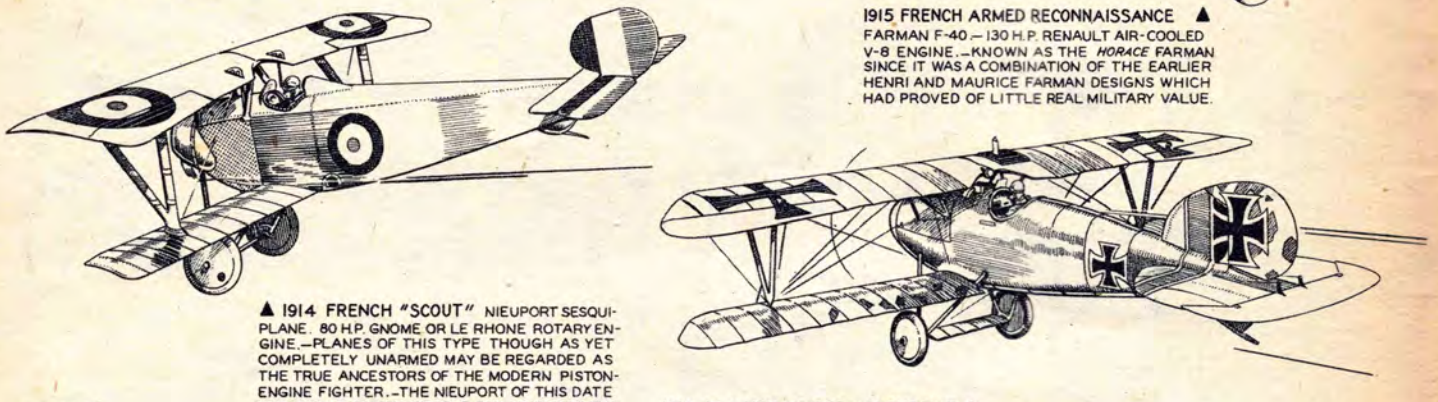
▲ 1914 GERMAN RECONNAISSANCE
ALBATROS BIPLANE.—100 H.P. 6-IN-LINE LIQUID-COOLED BENZ ENGINE.—UNARMED



1914 BRITISH GENERAL PURPOSE ▲
AVRO 504K.—50-80 H.P. GNOME ROTARY ENGINE.— BRIEFLY EMPLOYED AS AN UNARMED OBSERVATION PLANE AND MAKESHIFT BOMBER IT BECAME, *WITH 100 H.P. MONO-GNOME*, STANDARD BRITISH BASIC TRAINER FOR REMAINDER OF 1914-18 WAR

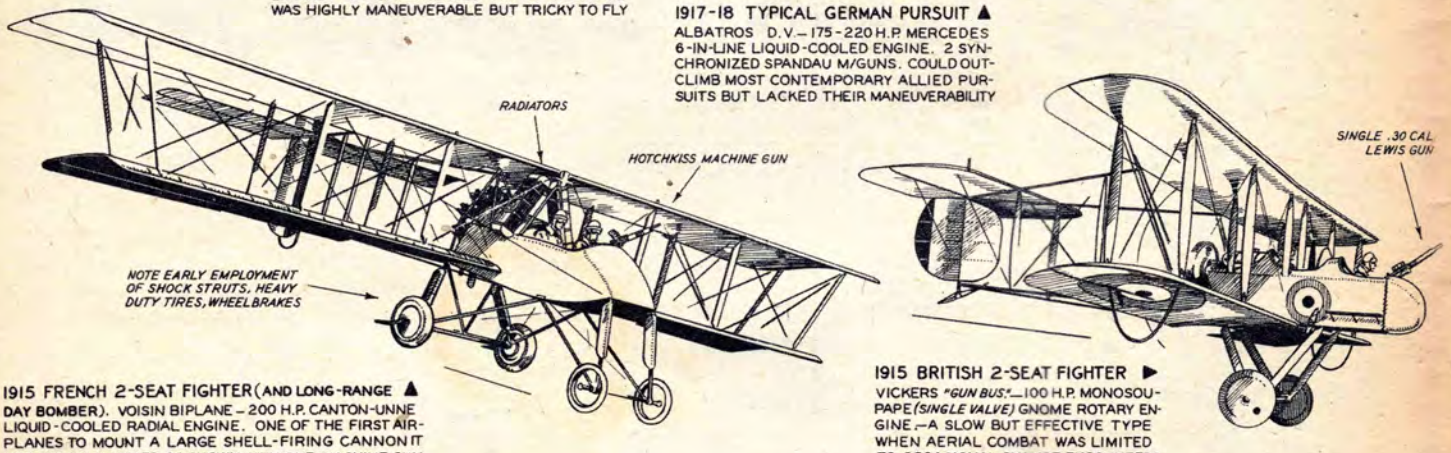
DOUGHNUT TIRES WERE FOUND IMPRACTICAL FOR THE PREVAILING SOFT RUNWAYS OF THIS PERIOD AND SOON REPLACED WITH LARGER WHEELS

1915 FRENCH ARMED RECONNAISSANCE ▲
FARMAN F-40 — 130 H.P. RENAULT AIR-COOLED V-8 ENGINE.—KNOWN AS THE *HORACE* FARMAN SINCE IT WAS A COMBINATION OF THE EARLIER HENRI AND MAURICE FARMAN DESIGNS WHICH HAD PROVED OF LITTLE REAL MILITARY VALUE.



▲ 1914 FRENCH "SCOUT" NIEUPORT SESQUIPLANE. 80 H.P. GNOME OR LE RHONE ROTARY ENGINE.—PLANES OF THIS TYPE THOUGH AS YET COMPLETELY UNARMED MAY BE REGARDED AS THE TRUE ANCESTORS OF THE MODERN PISTON-ENGINE FIGHTER.—THE NIEUPORT OF THIS DATE WAS HIGHLY MANEUVERABLE BUT TRICKY TO FLY

1917-18 TYPICAL GERMAN PURSUIT ▲
ALBATROS D.V.—175-220 H.P. MERCEDES 6-IN-LINE LIQUID-COOLED ENGINE. 2 SYNCHRONIZED SPANDAU M/GUNS. COULD OUTCLIMB MOST CONTEMPORARY ALLIED PURSUITS BUT LACKED THEIR MANEUVERABILITY



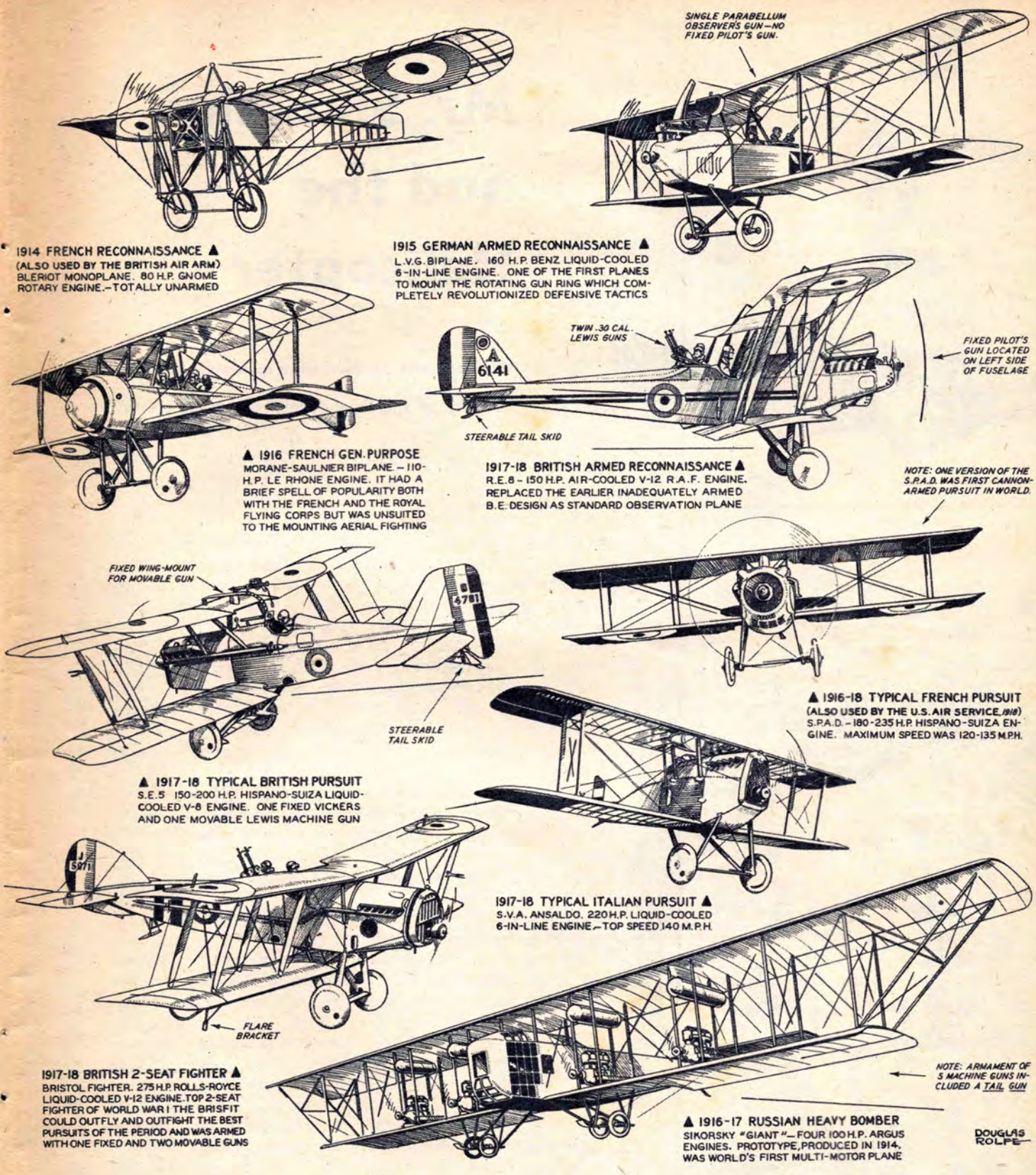
1915 FRENCH 2-SEAT FIGHTER (AND LONG-RANGE DAY BOMBER). ▲
VOISIN BIPLANE — 200 H.P. CANTON-UNNE LIQUID-COOLED RADIAL ENGINE. ONE OF THE FIRST AIRPLANES TO MOUNT A LARGE SHELL-FIRING CANNON IT WAS USUALLY ARMED, AS SHOWN, WITH ONE MACHINE GUN

1915 BRITISH 2-SEAT FIGHTER ▶
VICKERS *"GUN BUS."*—100 H.P. MONOSOUPAPE *(SINGLE VALVE)* GNOME ROTARY ENGINE.—A SLOW BUT EFFECTIVE TYPE WHEN AERIAL COMBAT WAS LIMITED TO OCCASIONAL CHANCE ENCOUNTERS

THE MILITARY AIRPLANE (1914-18)

Although a few airplanes had been employed in the Balkan Wars of 1912, they served merely as unarmed and rather inadequate extensions of the tethered balloon, and it was not until World War I that the possibilities of the airplane as a combat weapon were realized. Development during this war was rapid, and at its close the airplane was firmly established as a formidable instrument of attack with roughly the same classifications and specialized tasks in vogue today.

Between the years 1914 and 1918 airspeeds rose from a dubious 60-85 mph to almost 150 mph, while armament, totally non-existent on the first military planes, steadily increased until all service planes were provided with both defensive and offensive weapons. Flares, rockets, cannon and multiple machine gun installations were in common use



by 1918; radio had replaced signal lamps by 1915.

In World War I design, the Germans favored heavy but reliable liquid-cooled engines, monocoque fuselages and swept-up or washed-out wing tips. The French were strong on steel tube airframes, used both liquid-cooled and radial air-cooled (rotary) engines. The British stuck to the old wood-wire construction, with all kinds of engines. Other countries, U.S.A. included, relied mainly on surplus French and British types, though Russia designed the first multi-engine bombers.

Planes illustrated on these pages, running from left to right and from top to bottom, illustrate stages in the development of: unarmed reconnaissance and general-purpose planes, armed reconnaissance, typical pursuit types (single-seat fighters), two-seat fighters, fighter-bombers and one heavy bomber.

Mr. Sikorsky and the Helicopter

With present performance making big news, the "Daddy of the Eggbeater" discusses its future

■ In Korea, the helicopter made a permanent place for itself in the table of equipment of our fighting forces, along with the jeep and the tommy-gun. Experimental airlines in Los Angeles and Chicago have indicated there is a worthwhile function for the "ambitious eggbeater" in our future society. This form of transportation that offers motion in any direction at respectable speed, that can bring airlift to our very rooftops, will ultimately have a real impact on the daily lives of all of us. But there still remain various unanswered questions—just what kind of helicopter, how big will it be, what functions will it serve—and when?

To learn what's in the next chapter, Air Trails went to the No. 1 pioneer and developer of the helicopter—Igor I. Sikorsky. Now engineering manager of the Sikorsky Division of United Aircraft Corporation at Bridgeport, Conn., this famed designer furnished the following answers to such questions as:

What is the most important factor influencing the development of helicopters?

Mr. Sikorsky: "Public acceptance. The science of rotating-wing aircraft has been developed to a status where we can build almost any kind of helicopter vehicle that civilization can actually use. There is no sense in forcing the issue. If some progessively eccentric billionaire were to order ten thousand four-place helicopters, they could be built for the price of a fixed-wing airplane. However, the first serious accident involving more than just the occupants of the machine would make helicopters more enemies than months of sensible operation could compensate. The best approach is to let the helicopter find its own way, for the public to create its own uses for this highly flexible means of transportation.

"Then civilization will have an opportunity to reshape its pattern of living around the new (*Continued on page* 62)

Igor I. Sikorsky

By WM. S. FRIEDMAN

Your Job in Aviation

Flight Instructor

To be successful he must have student's confidence, achieved only through flawless flying technique, patience and understanding

■ Bill Daniels sounded more than slightly stupid. "Why," he asked, "did we float so far down field on that last landing?" Minutes later he popped another question: "Why does an airplane stall?"

You'd expect such questions from a beginner in aviation, but coming from an experienced, and expert, flight instructor, they sounded more than slightly out of character.

But Bill knew what he was doing. Rather than stupid, these and a hundred more questions were designed to elicit one overall answer: "Could the young man at the controls explain in simple, lucid, easily understood terms?" For the young man flying the airplane was himself a candidate for flight instructor. And Bill wanted to make certain his student would be able to convey ideas to later students under his guidance in primary, basic and advanced training.

The flight instructor is of more than average importance in the general scheme of flying airplanes and other aircraft. True, he has only one man aloft at this hour. Another may ride with him this afternoon. Still others may solo during the day under his direction. Together, these students will fly many passengers during their careers, or drop bombs or handle the delicate controls on swift fighters. Bill's responsibility continues long into the future. Unless he does his job well today, the results of any carelessness may show up in civilian or military trouble years hence.

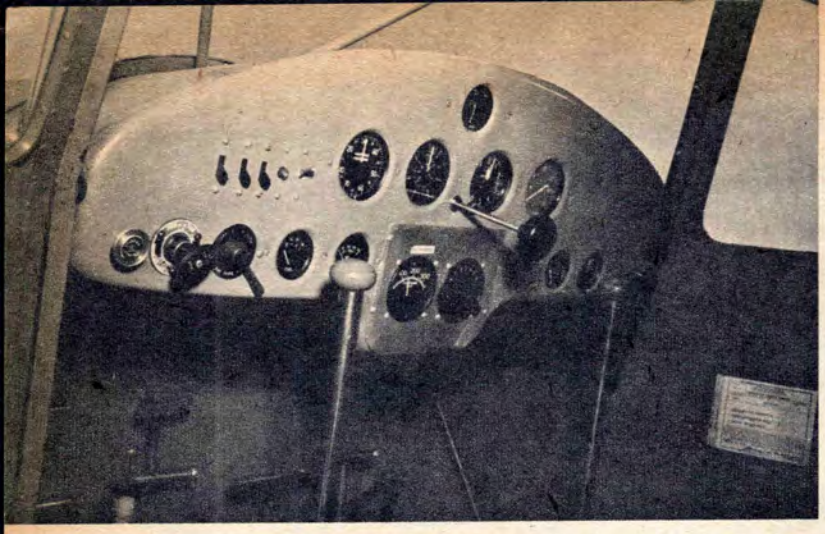
Right now is a good time for Bill to take stock of his capabilities. For he is being called upon to help train the pilots who will train the students during the expanding defense program. The first of several Air Training Command sponsored schools is getting under way at Greenville, Miss. There 124 instructors will tutor selected trainees in continuing batches of 500 for 15 months. Not less than three other schools will operate in this fashion, to say nothing of other courses offered by private operators. Demand for pilots, and instructors, is on the upswing.

As most readers know, the services break down training into three phases: primary, basic and advanced. The schools divide their courses generally into private and commercial, with the commercial separated into the counterpart of basic and advanced. It's up to Bill, and many others like him, to carry the new candidate all the way through, from his first to his final check flight.

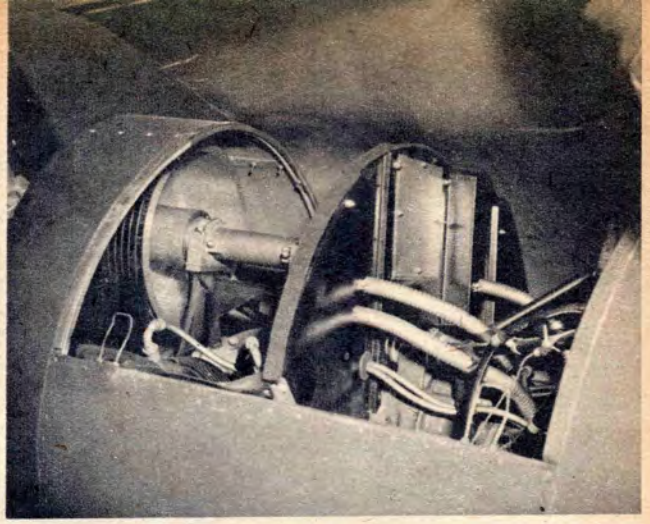
You can't catalogue Bill as tall or short, as blond or brunet. But you can rest assured he's able to adapt his personality to others. He can make friends and win confidence. Bill's not like the so-called typical instructor of two decades ago: the sort who scared the pants off a student first time up, and beat his head with a spare stick.

"Inspiring confidence in my student is half the battle," Bill tells you. "I've got to be a good pilot myself, so I know how far to let a student go in making mistakes, especially on landings. There's safety in altitude, you know. Anyone can learn to fly, provided the problem is presented properly. It's like walking or dancing—one foot at a time."

Bill wants to know all about the candidate before the first flight. Is he married? Any worries or problems? Why does he want to fly? Sitting in (*Continued on page* 66)



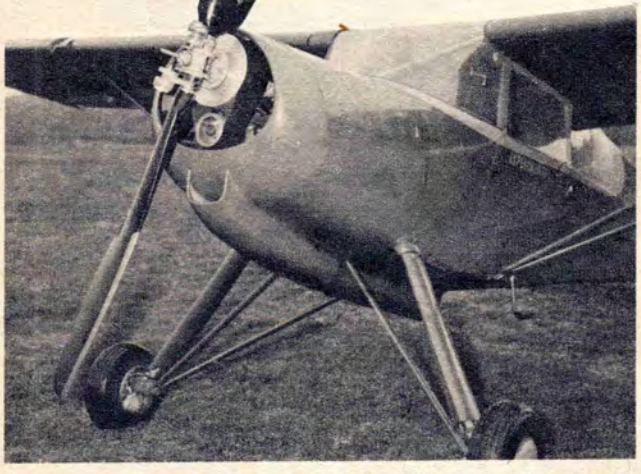
Cockpit of the Helioplane is conventional and functional. Good over-the-nose visibility is due to raised propeller thrust line.



Ten automobile fanbelts are used to reduce propeller speed which turns at a rate of only 1,200 rpm. Belt drive is quieter than gears.

HELIO / TWO

This cousin to the helicopter may be tomorrow's personal plane

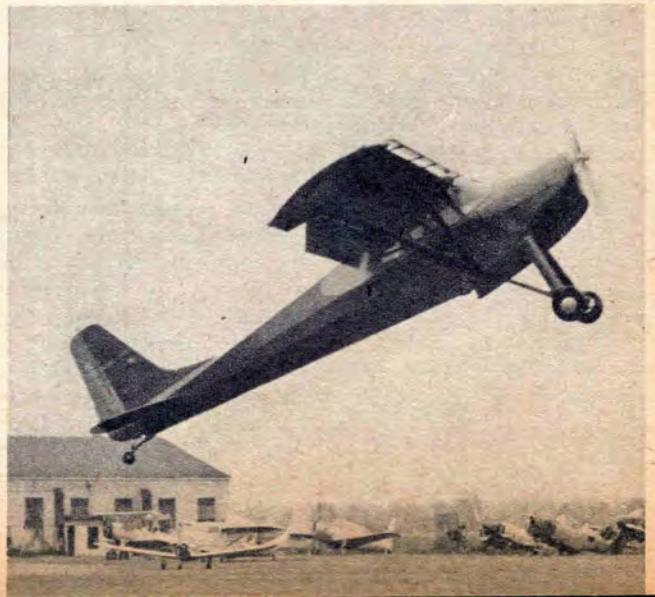


Large propeller, diameter 9 feet, is 75% more efficient than conventional, and considerably quieter. Note belt reduction drive.

■ It may not take off from and land on a roof, but the Helioplane Two will practically do everything a helicopter can and at half the price. This remarkable 2-passenger plane developed and built by Massachusetts Institute of Technology professors Otto Koppen and Lynn Bollinger looks like the answer to a personal pilot's prayer. It will fly as slow as 30 mph, land and get out off an area no larger than a tennis court, is stall and spin proof, but at the same time has a good cruising speed and load lifting ability. One of its interesting features is forward location of landing gear which enables plane to fly off ground without first raising the tail as in conventional craft.

Full span slats effectively prevent stall which occurs at an angle of attack of 29 deg. Greatest angle of descent: 14 deg.

The Helioplane can get out of a remarkably small space, land on a tennis court. Rate of descent is slower than that of a parachute.



By FRANK TINSLEY

Ahead of His Time

BILL BARNES—PROPHET

In combat readiness above is the last plane designed by Bill Barnes, the 1938 Charger, forerunner to today's long-range twin-engine multi-place fighter. The three-place craft incorporated, even then, radio navigation, amphibious gear, buried diesel engines of 1,800 hp each. A distinct innovation was the single-blade propellers. Wings and tail surfaces were of stainless steel; fuel load in integral wing tanks.

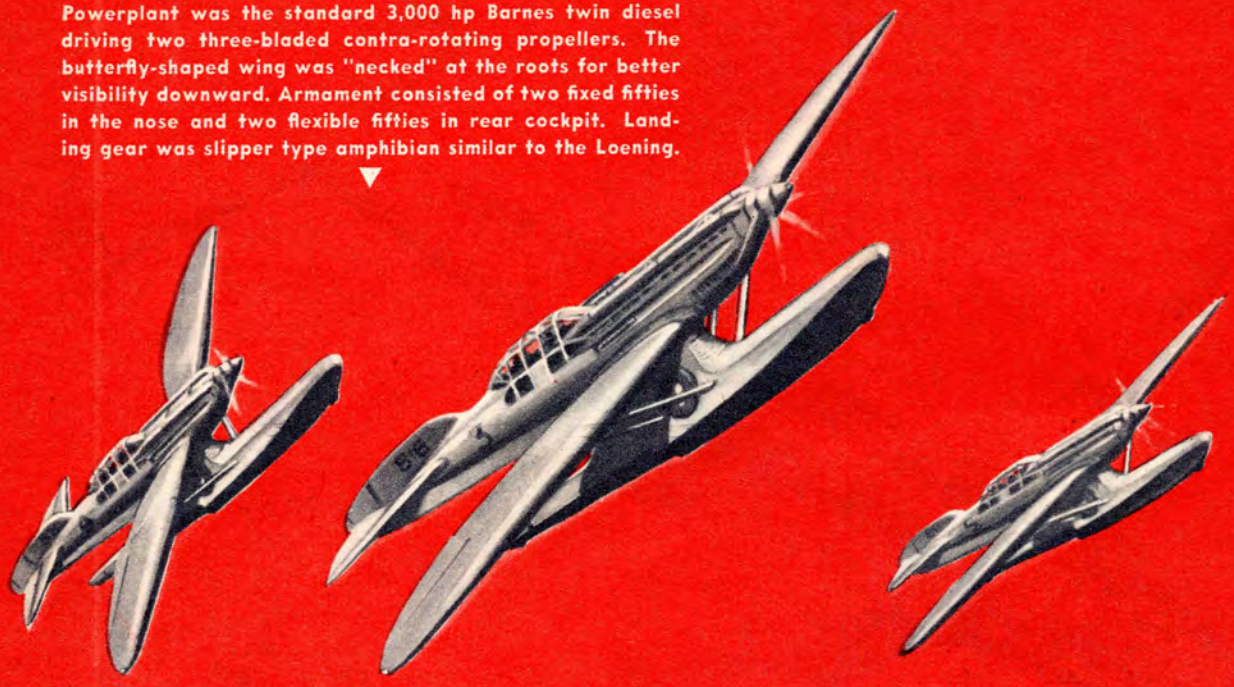
Bill Barnes, Air Adventurer

■ Bill Barnes, whose adventures were recorded in the pages of Air Trails from 1934 to 1938, was ahead of his time in many ways—as a designer, pilot and inspired aerial tactician. His planes not only foreshadowed those of today in many technical details, but the tactical philosophy on which they were based has also proven prophetic to an amazing degree. The secret of Bill Barnes' brilliance lay in his unique background and personality. To an eternally questing mind and practical mechanical imagination he added the know-how of the combat flyer and the hard-boiled savvy of the trained engineer. His service in World War I had taught him all the tricks of the fighting pilot's trade, as well as a vital awareness of the airplane's faults and limitations.

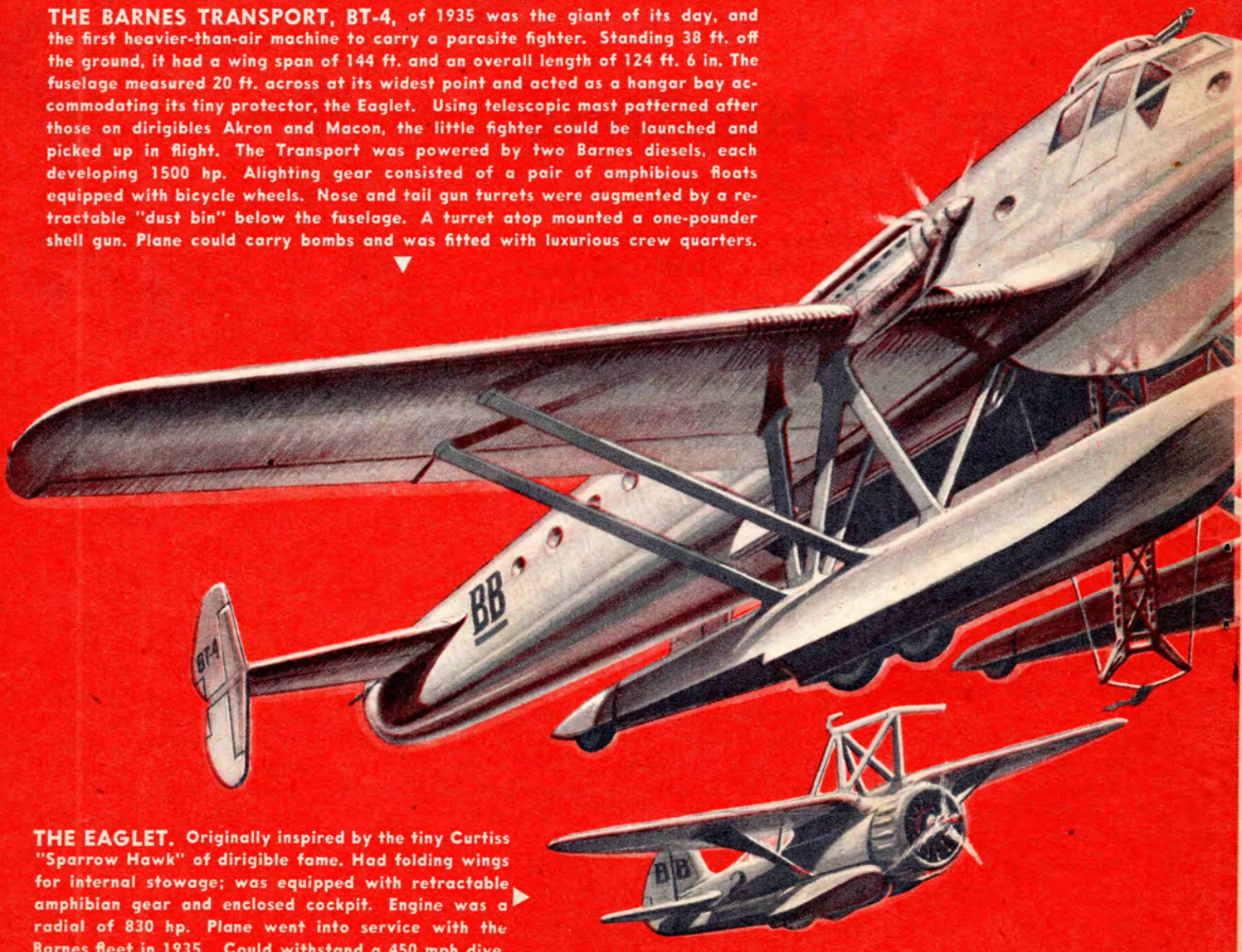
In this presentation of the Bill Barnes planes, we have limited ourselves to the final flowering of the fleet—the culminating models of each of his types. Space limitation forbids a more detailed description of each plane. We have, however, tried to give you an accurate pictorial idea of the ships, plus solid model plans taken from the original blueprints.

As a final point: Many of our readers have wondered, many have written in to ask—where is Barnes now? Here is as much as we are permitted to tell. In 1947, Bill disappeared while on a confidential mapping mission somewhere west of the Bering Sea. For a long time the public believed him dead. Recent reports have him very much alive, and a part of the guided missiles program.

IMPROVED SNORTER, BF-4D, joined Bill Barnes' fleet in 1936 and was the fourth of his basic two-seater fighters. Powerplant was the standard 3,000 hp Barnes twin diesel driving two three-bladed contra-rotating propellers. The butterfly-shaped wing was "necked" at the roots for better visibility downward. Armament consisted of two fixed fifties in the nose and two flexible fifties in rear cockpit. Landing gear was slipper type amphibian similar to the Loening.

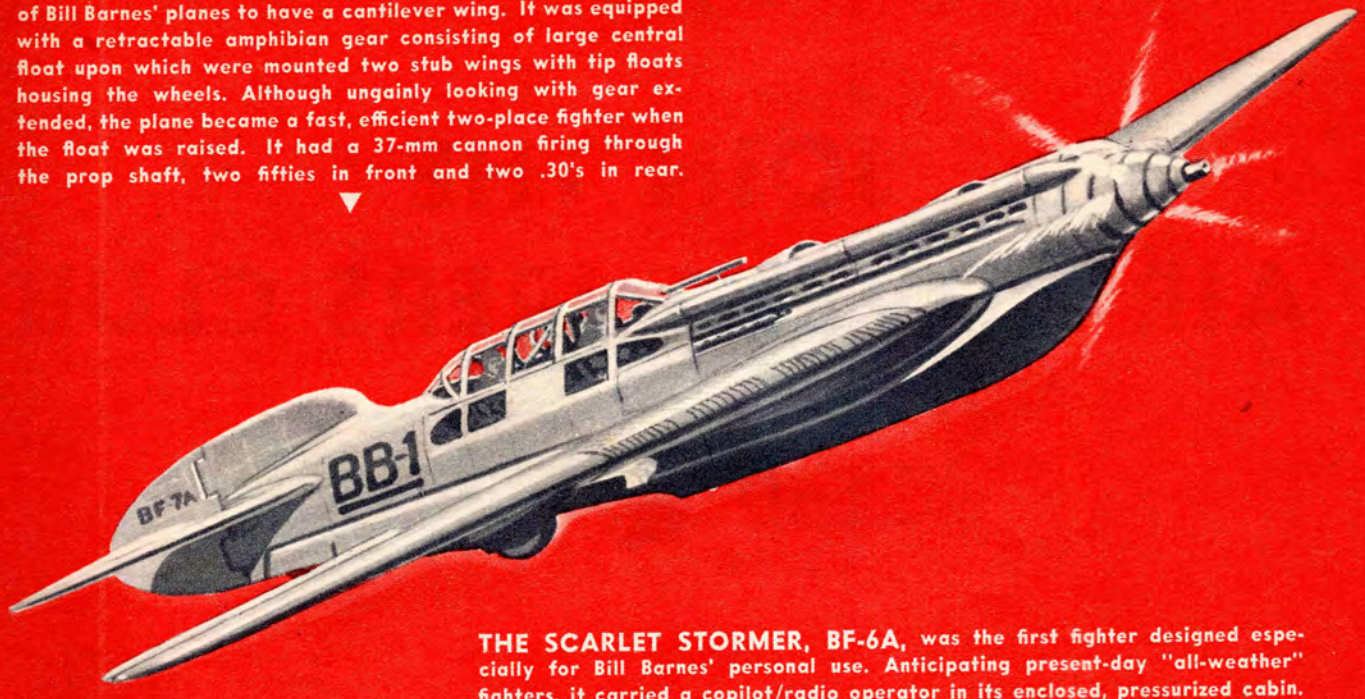


THE BARNES TRANSPORT, BT-4, of 1935 was the giant of its day, and the first heavier-than-air machine to carry a parasite fighter. Standing 38 ft. off the ground, it had a wing span of 144 ft. and an overall length of 124 ft. 6 in. The fuselage measured 20 ft. across at its widest point and acted as a hangar bay accommodating its tiny protector, the Eaglet. Using telescopic mast patterned after those on dirigibles Akron and Macon, the little fighter could be launched and picked up in flight. The Transport was powered by two Barnes diesels, each developing 1500 hp. Alighting gear consisted of a pair of amphibious floats equipped with bicycle wheels. Nose and tail gun turrets were augmented by a retractable "dust bin" below the fuselage. A turret atop mounted a one-pounder shell gun. Plane could carry bombs and was fitted with luxurious crew quarters.



THE EAGLET. Originally inspired by the tiny Curtiss "Sparrow Hawk" of dirigible fame. Had folding wings for internal stowage; was equipped with retractable amphibian gear and enclosed cockpit. Engine was a radial of 830 hp. Plane went into service with the Barnes fleet in 1935. Could withstand a 450 mph dive.

THE SILVER LANCER, BF-7A, built in 1936, was the first of Bill Barnes' planes to have a cantilever wing. It was equipped with a retractable amphibian gear consisting of large central float upon which were mounted two stub wings with tip floats housing the wheels. Although ungainly looking with gear extended, the plane became a fast, efficient two-place fighter when the float was raised. It had a 37-mm cannon firing through the prop shaft, two fifties in front and two .30's in rear.



THE SCARLET STORMER, BF-6A, was the first fighter designed especially for Bill Barnes' personal use. Anticipating present-day "all-weather" fighters, it carried a copilot/radio operator in its enclosed, pressurized cabin. To increase combat visibility a gulled shoulder wing of butterfly planform was utilized. Engines were two liquid-cooled V-12's hooked up end-to-end driving two contrarotating props. Engine cooling was supplied by skin-type radiators mounted in the wings. Armament consisted of two cal. .50 m.g.'s and a 37-mm cannon firing through the hollow prop shaft. Landing gear was of the retractable amphibious type. The Stormer was built in 1934.

FRANK TINSLEY

JOIN THE AIR ADVENTURERS CLUB

■ For the second time in less than a decade the Air Adventurers Club becomes active to band together young American citizens for the purpose of making America first in the air.

The first time was prior to World War II when a complacent citizenry watched a hostile foreign power create a fearful aerial striking force —and did little about it. It was a handful of farseeing airmen, joined by thousands of alert, air-minded young men and women banded together in such groups as the Air Adventurers, who were able to focus public attention on the critical needs in the fields of air power, air science and air development.

Sixty thousand active members of the old Air Adventurers Club preached the doctrine of preparedness-in-the-air. When America joined other democratic forces in the fight against totalitarianism, many of these Air Adventurers members went into full-scale aviation as engineers, mechanics, pilots, flight engineers, control tower operators—to mention only a few of the highly specialized and mighty important jobs they filled.

Again the time has come for all air-minded young men and women to join together and work for increased recognition of aviation, for a mightier air army, for public acceptance of a means of travel that has already worked a minor revolution in the lives of all of us and will soon drastically change the living patterns of everyone on this planet.

(For some pretty straight thinking along *those* lines we refer you to the interview with the distinguished aeronautical designer, Igor Sikorsky, which starts on page 28 of this issue!)

Well, fine, you say. How are we going to do all this?

A fair question, and here's the answer: by creating Air Adventurers clubs in every community in America. These clubs will be designated as Flights or Squadrons. Eleven or fewer AA'ers can become an officially recognized Flight, at least 4 members are required to start a Flight; 12 or more members can form a Squadron.

Air Adventurers will be designated as:

Airman, Apprentice Class.
Airman, Third Class.
Airman, Second Class.

AGE LIMITS: There are no minimum or maximum age limitations on Air Adventurers Club membership.

MAIL TO: Air Adventurers, c/o Air Trails, 304 East 45th Street, New York 17, N. Y. Print all information required on the application; sign where indicated. *At same time,* print your name and address on both labels and mail with coupon.

I hereby apply for membership in the Air Adventurers Club and promise to do everything in my power to uphold the principles of the organization and work for the advancement of American aviation. I enclose 25¢ in well wrapped coins for my credentials ☐; 50¢ for credentials *and pin* ☐—(indicate which).

.....
(Name—print)

.....
(Street address—print)

.....
(City—print) (Zone) (State)

....
(Age) (Sign here)

(AT351)

.....
(Name—print)

.....
(Address—print)

.....
(City, Zone, State—Print)

***Print* your name & address on both these forms and mail inside the envelope with your application form; they will be used as labels for mailing**

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(Name—print)

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(Address—print)

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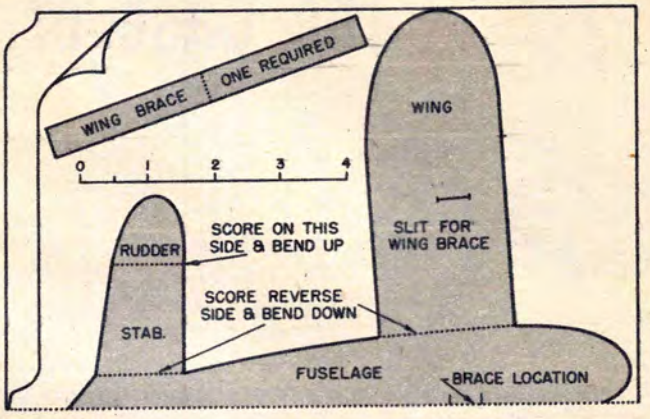
(City, Zone, State—print)

THEN WE'LL WORK TO KEEP AMERICA FIRST IN THE AIR



AIR ADVENTURERS TRAINING GLIDER #1

Airman, First Class.
Cadet Airman.
Master Airman.
Command Airman.

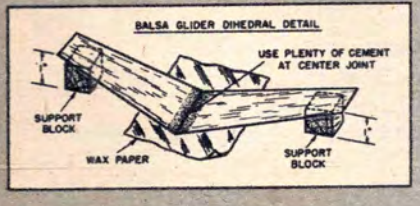
Members will advance in rank as they complete satisfactorily certain tests which will demonstrate their knowledge of aviation in general, aerodynamics, theory of flight, parts of a plane, basic piloting techniques and the like. Model airplanes will play a part in the first four ratings, but only from the standpoint of what they teach about full-size aircraft.

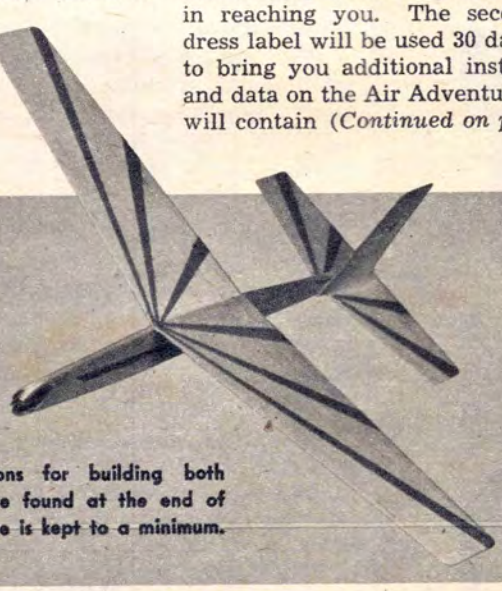
For instance, by the time a new recruit completes the two simple gliders presented here he or she will be familiar with the major components of a plane, will understand rudiments of adjustment and will be ready for more advanced types which will be presented in the next few issues and which will help the member pass his or her tests on aerodynamics. The models are not an end unto themselves, they are an integral part of the air training program which is being set up by a board of well-known experts for the Air Adventurers. A member may go on to advanced modeling, Flights or Squadrons may run model meets under various sponsors, but such activity while encouraged will not be required.

The first thing you should do if you wish to participate in this work is to apply for membership. A fee of 25¢ is required to cover the cost of preparing and mailing your credentials. As soon as your application is received and processed, you will get a membership card and a personal copy of the Preliminary Manual for Airmen. This will give you detailed information on how to set up a Flight or Squadron, who should be invited to participate in the organization, how to prepare for your classification tests and the like.

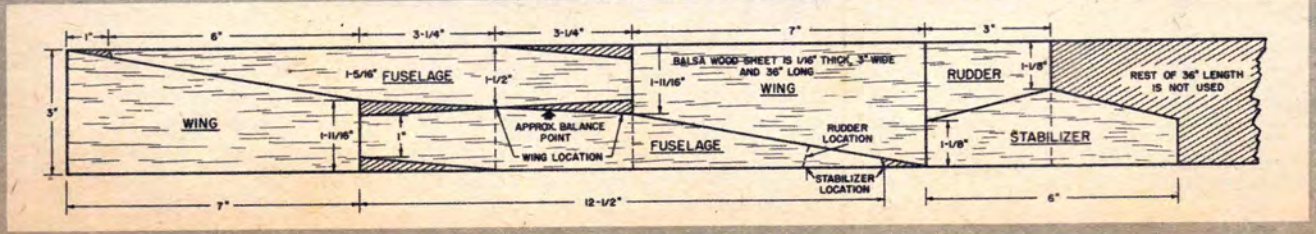
One of the address labels which you are requested to fill out and mail to headquarters along with your membership application form will be pasted on the envelope which will bring back your credentials—so print clearly, otherwise your membership card may be delayed in reaching you. The second address label will be used 30 days later to bring you additional instructions and data on the Air Adventurers and will contain (*Continued on page 74*)

AIR ADVENTURERS TRAINING GLIDER #2





Complete instructions for building both these gliders will be found at the end of article; building time is kept to a minimum.



GEORGE GARDNER'S

The Case of the Nameless Passenger

The PAA Load Event dummies gang up on the Educational Director of Pan American World Airways. Their approach is reminiscent of that used on contest directors by some of our best modelers. But we love the exasperating dummies, just as we love our argumentative modelers, and take pleasure in reproducing a conversation which took place recently between Director George Gardner and the dummies: the familiar occupants for Classes A and B of PAA Load Event, and the new scaled-down payload occupant for the Half-A Class which is being introduced in PAA Load Event this year.

■ Gardner was busy at his desk, writing the rules for 1951 PAA Load Event. A&B Dummy was kibitzing at one side of the Director's yellow pad and the new guy for Half-A was making himself a nuisance at the other side.

A&B Dummy: "Hey, Doc, what's my name?"

George Gardner: "Go away, please, I'm busy."

A&B: "Without me you'd have nothing to do. Nothing! What's my name?"

GG: "All right, all right. Just let me finish this section about the new Half-A visibility requirements first."

Half-A Dummy: "Listen, bum, you've had me sitting on your desk for six weeks. No name. And I'm not even up to weight. Heck, I'm not even neat. Crooked shoulders."

GG: "Will you take it easy, Junior? I had enough trouble getting your dimensions. You just wouldn't come out even. Look at you. Here's my handkerchief. Blow hard . . . Harder!"

Half-A: "OKAY, so what's my name?"

A&B: "And what's mine?"

GG: "Well, *you* are the so-called occupant or dummy for Classes A & B in PAA Load Event. You must have a body at least 3 x 3 x 1 inches surmounted by a head at least 1 x 1 x 1. You may be made of any material(s) at the option of the builder, and you must weigh at least 8 ounces. For Class A the builder must carry one of you. For Class B he has to carry two of you. That's a pound of payload.

"And *you,* Junior. You are the so-called dummy or occupant for the new Half-A classification in PAA Load Event. You must have a body at least 1½ inches wide, by 2¼ inches high by ¾ inches thick, surmounted by a head at least ¾ x ¾ x ¾ inches. What a set of dimensions! You may be made of any material(s) at the option of the builder and you must weigh at least three ounces. He has to carry one of you when competing in Half-A payload."

A&B: "You call that a name?"

Half-A: "Phooey."

GG: "Now look here, fellows, you're getting too rambunctious. I'll tell you something. You were both dreamed up by a very nice gentleman, Mr. Dallas Sherman, the daddy of PAA Load Event. Mr. Sherman is an important person in Pan American World Airways. He works in Tokyo now, and he puts on PAA Load Events out there. The company has me do it in the United States. I'm in charge of it, too, and that means I am in charge of you. And if you don't mind your A's and B's and also your Half-A's, I'll write to Uncle Dallas about it. May even radio him—"

A&B: *"So!* Sherman has a name. You have a name. What have we got? A rule and specification."

Half-A: "Make that phooey double."

GG: *"Listen,* Junior—"

Half-A: "Junior (*Continued on page* 81)

NAME THE NAMELESS PASSENGER!

Air Trails (304 E. 45th St., New York 17, N. Y.) will pay $25 for the best set of names for the PAA-Load Half-A and combined A-B occupants. Each set of suggested names must be accompanied by a 40-50 word typewritten or printed statement on the fun and value of flying PAA-Load models. Judges will be George Gardner; Russell Nichols, Executive Director of the Academy of Model Aeronautics, and A. L. Lewis, "AT" Editor. All entries must be postmarked no later than midnight, February 28, 1951. No entries can be returned.

Crowbar "56"

Two-time winner in the National Meet PAA-Load event, and first to carry international Clipper Cargo . . . could you ask for more?

By RAY MATTHEWS

■ Now before you read this gobbledygook about my pride and joy the Crowbar, let me state that it was built, not designed. No long mathematical formulas were used. However, wind tunnels were plentiful because every Oklahoma City Model Aviation Club member has one "built in"—windy country, you know. The long involved calculations consists of setting up a Pay Load dummy and putting enough wood around it to hold it and still look something like an airplane—we freely admit it does look odd. The only thing that has been in this model builder's mind is that beautiful ships with a multitude of gadgets which are prone to mechanical difficulties never win a contest sitting on the ground.

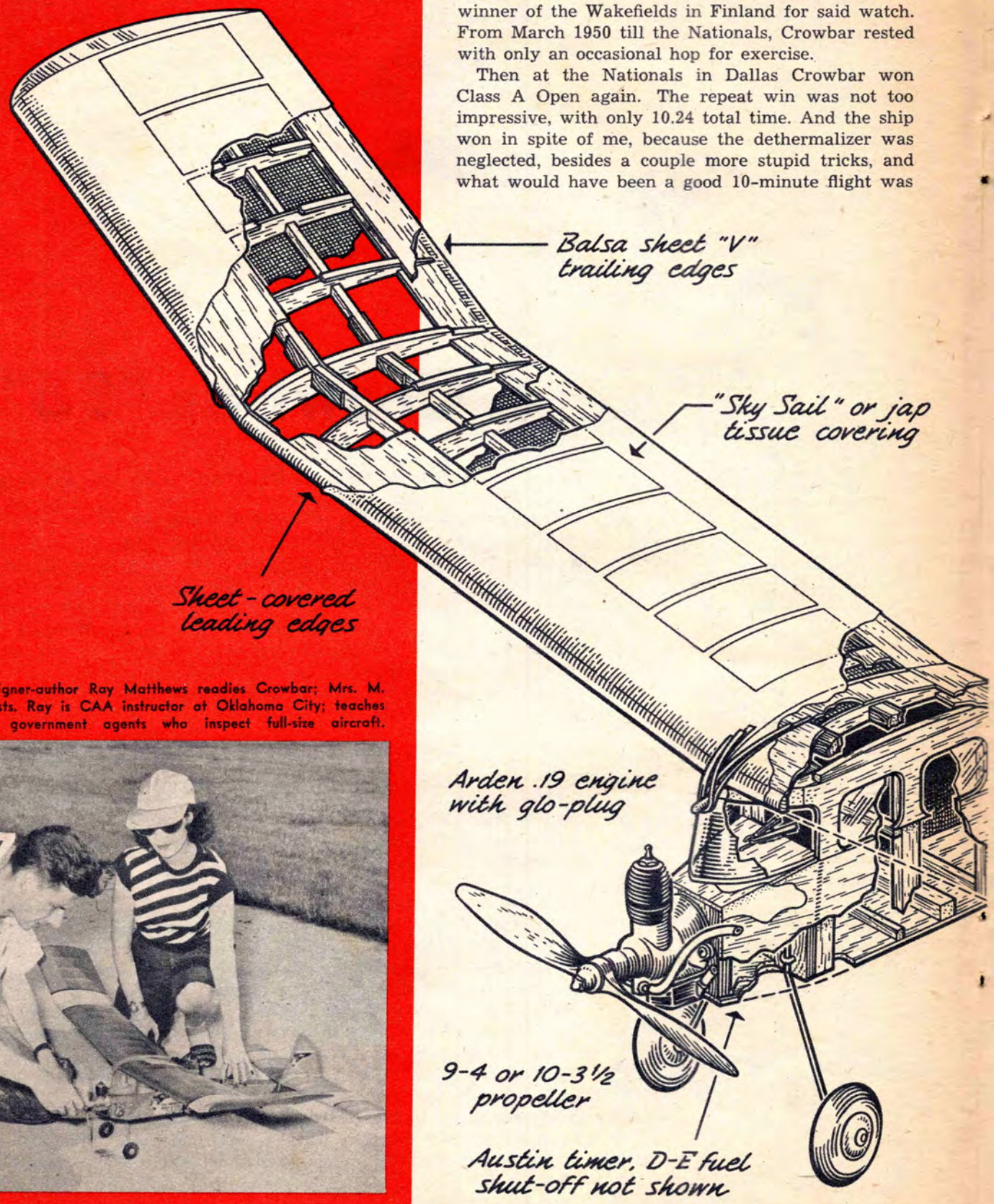
The inspiration for a Pay Load job started when my good friend Fred Whiting came home from the 1948 Nats where he had taken second place in the first Pay Load event ever to be held. The ship he flew had a Sailplane wing and a Buzzard Bombshell fuselage. This ship powered by a K&B Torp flew fine. With it as a guide of what Pay Load was, I slept on the idea for nearly a year. In my shop, which is the gathering place for some of the darnedest theories ever heard, Pay Load got plenty of gum-beating and design theories. I believe Pay Load as it is today will soon be by far the most popular event at the Nationals, if some screwball pressure group doesn't talk Pan American into changing the rules. (However, knowing George Gardner of P.A.A., there is little chance of this.) Thanks should go to the O.C.M.A.C. for the success of my ship, because everyone has had a hand in it, and what one of us builds we all build until the design is perfected.

Anyway, down to facts. This "hulk" was slapped together to be flown at the 1949 Nationals where it won first place with 13:37.0 for its longest flight. In the winter of 1950, March to be exact, the

CROWBAR "56"

Crowbar was given the job of flying a watch across the Rio Grande for Pan American Airways. It took off on the first international "cargo" flight by model-plane from Laredo, Tex., on border between Texas and Mexico. This was the beginning of a long trip to the winner of the Wakefields in Finland for said watch. From March 1950 till the Nationals, Crowbar rested with only an occasional hop for exercise.

Then at the Nationals in Dallas Crowbar won Class A Open again. The repeat win was not too impressive, with only 10.24 total time. And the ship won in spite of me, because the dethermalizer was neglected, besides a couple more stupid tricks, and what would have been a good 10-minute flight was



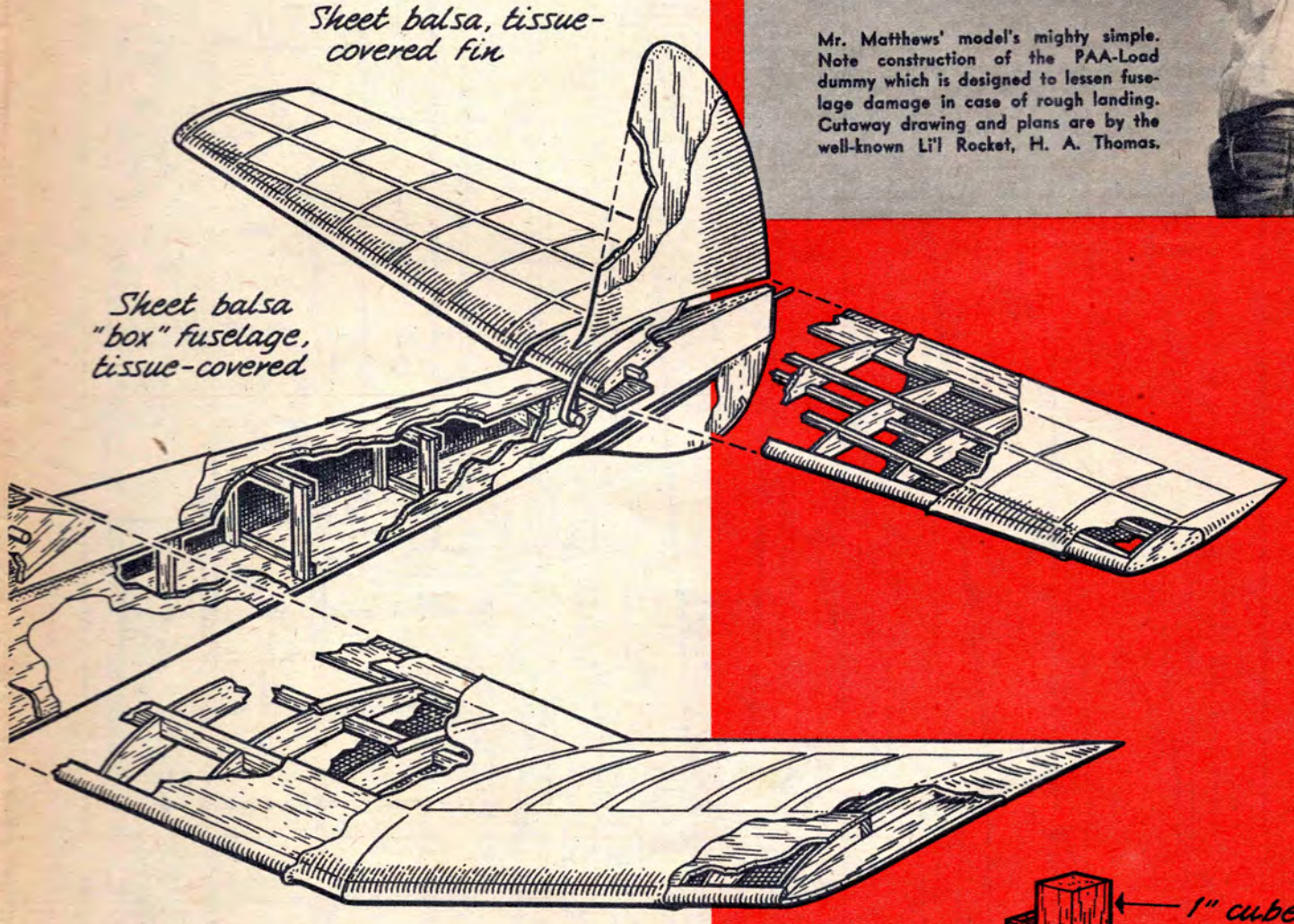
Designer-author Ray Matthews readies Crowbar; Mrs. M. assists. Ray is CAA instructor at Oklahoma City; teaches the government agents who inspect full-size aircraft.

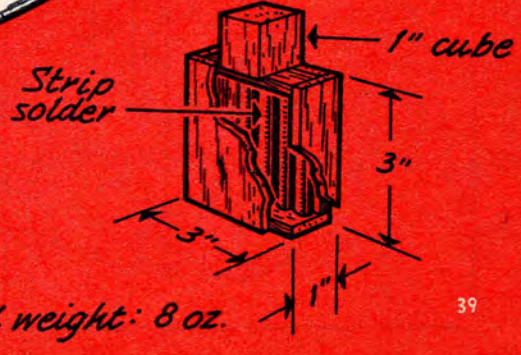
cut to around 4 minutes. (Also, I had a good case of "Nationalitis.") In the district Pay Load contest about a month after the Nationals, the Crowbar stole first place away from its brother Crowbars flown by the O.C.M.A.C. gang.

Now let's get started on the construction. Select your balsa wood carefully for the job it has to do. I do not think it necessary to scale the fuselage up to full size; just lay out the sides on a piece of $\frac{3}{32}$" x 3" x 36" by dimensions given on the plan. Cut two like this and make sure they are both exactly the same. With a sharp pencil scribe line across the fuselage sides at points shown so that the sharp bends can be made.

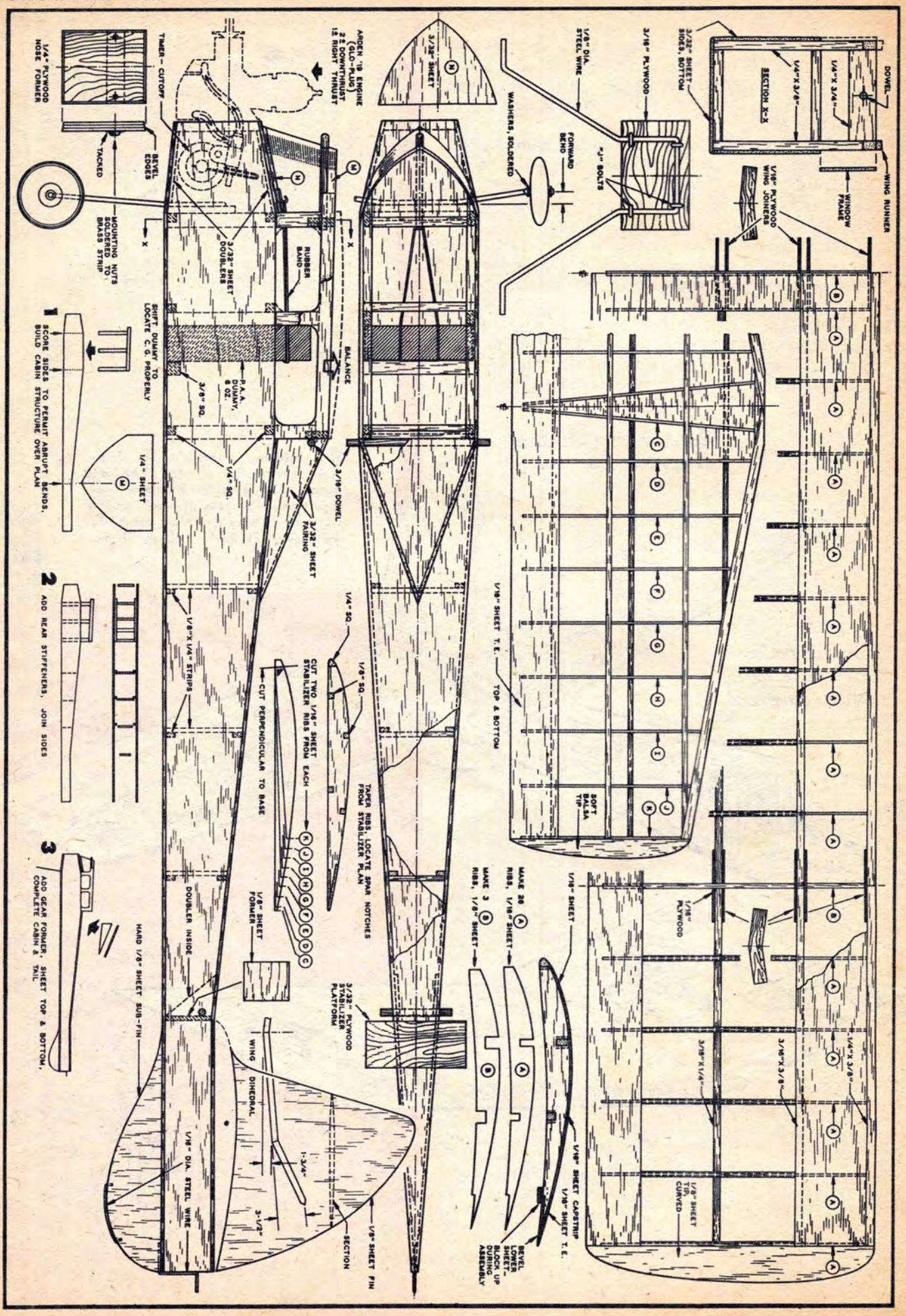
Build cabin structure by laying down the three main uprights and gluing the top brace. You will need two sides of the cabin, so the two can be built one on top of the other. (*Continued on page* 64)

Mr. Matthews' model's mighty simple. Note construction of the PAA-Load dummy which is designed to lessen fuselage damage in case of rough landing. Cutaway drawing and plans are by the well-known Li'l Rocket, H. A. Thomas.





CROWBAR "56"


DOWEL
WING RUNNER
WINDOW FRAME
1/4"X 3/4"
1/4"X 3/8"
SECTION X-X
3/32" SHEET SIDES, BOTTOM
3/16" PLYWOOD
1/16" PLYWOOD WING JOINERS
"J" BOLTS
1/8" DIA. STEEL WIRE
WASHERS, SOLDERED
FORWARD BEND
3/32" SHEET
ARDEN '19 ENGINE (GLO-PLUG) 2° DOWNTHRUST 1° RIGHT THRUST
TIMER - CUTOFF
BEVEL EDGES
TACKED
1/4" PLYWOOD NOSE FORMER
MOUNTING NUTS SOLDERED TO BRASS STRIP
RUBBER BAND
3/32" SHEET DOUBLERS
BALANCE
P.A.A. DUMMY, 6 OZ.
3/8" SQ.
1/4" SQ.
3/16" DOWEL
3/32" SHEET FAIRING
SHIFT DUMMY TO LOCATE C. G. PROPERLY
1/4" SHEET
1 SCORE SIDES TO PERMIT ABRUPT BENDS. BUILD CABIN STRUCTURE OVER PLAN
2 ADD REAR STIFFENERS, JOIN SIDES
3 ADD GEAR FORMER, COMPLETE CABIN & TAIL
1/16" SHEET T.E. TOP & BOTTOM
SOFT BALSA TIP
1/16" PLYWOOD
MAKE 20 (A) RIBS, 1/16" SHEET
MAKE 3 (B) RIBS, 1/8" SHEET
1/16" SHEET
1/16" SHEET CAPSTRIP
1/16" SHEET T.E.
BEVEL LOWER SHEET - BLOCK UP DURING ASSEMBLY
1/4"X 3/8"
3/16"X 1/4"
3/16"X 3/8"
1/8" SHEET TIP, CURVED
1/4" SQ.
1/8" SQ.
CUT TWO 1/16" SHEET STABILIZER RIBS FROM EACH
CUT PERPENDICULAR TO BASE
TAPER RIBS, LOCATE SPAR NOTCHES FROM STABILIZER PLAN
1/8"X 1/4" STRIPS
1/8" SHEET FORMER
3/32" PLYWOOD STABILIZER PLATFORM
DOUBLER INSIDE
HARD 1/8" SHEET SUB-FIN
WING DIHEDRAL
1-3/4"
3-1/2"
1/16" DIA. STEEL WIRE
SECTION
1/8" SHEET FIN

THE SECRETARY OF THE NAVY

WASHINGTON

20 DEC 1950

Dear Mr. Lewis:

It is a pleasure for the Navy to cooperate in the valuable training program furnished by the competition leading to the annual National Championship Model Airplane Contest. The skills and techniques required in building and flying model planes is of inestimable worth in this air age.

With good wishes, I remain

Sincerely yours,

Francis P. Matthews

Mr. A. L. Lewis,
Editor, Air Trails Magazine,
304 East 45th Street,
[illegible] N. Y.

Secretary of the Navy Francis P. Matthews (left) congratulates Lt. John H. Burton, USN, upon the latter's receiving the valued Frank G. Brewer Award for "inspiring and effective leadership in planning and carrying out the 1950 Air Youth Education and Model Airplane Programs of the . . . Navy." This is 1st time award went for modeling.

Dope Can

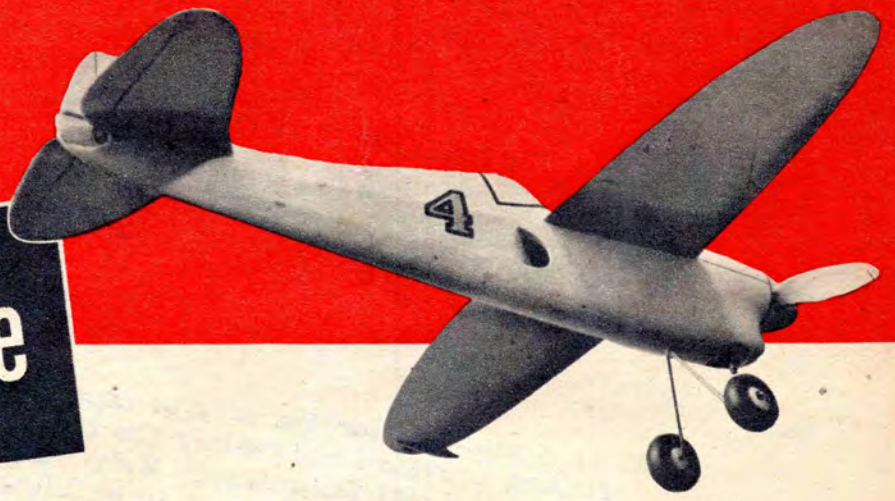
News, Views, Comments and Photos from Model Clubs and Enthusiasts in America and Overseas

■ We have been hearing a great deal lately about the big part the Navy has been playing in the model plane picture; you may have read our laments concerning the apparent lack of interest on the part of the Air Force in this valuable hobby-sport.

Looks as if that attitude has changed somewhat. International events permitting, the AF has scheduled the 1951 Air Force Model Airplane Championships for July 20-26 at Sheppard AFB, Texas! Teams of up to 15 men from each command in the AF will compete and as a result of this meet a team of 25 men will be selected as the official Air Force team to represent that service at the 1951 National Championships.

Lt. Harry G. Vogler, Jr., of Pittsburgh, has been named Project Officer for (*Continued on page* 82)

Petit Pete



Classic racing lines combined with a Half-A powerplant give you economy, beauty, speed

By BERNARD O. BECK

■ If there's a Cub in your den, *Petit Pete* may be just what you've been awaiting. Built around any of the three larger Cubs, she'll do a nice job of flying for you. Our ship mounts an .074 and really gets around with it. Take-off is fast and flat, with a genuine "scoot" in full flight. Control is adequate but not sensitive. *Pete's* flight characteristics should give you a pleasant surprise.

Features of the design include a removable engine unit, a bellcrank that is more sensitive to up than down, and a lightweight landing gear that will not tear loose. Of course, we've been using this type of fuselage construction for some time and consider it topnotch for Half-A. With *Pete's* ruggedness a bit of bad flying won't hurt anything but your pride. Weight is five ounces.

Although the different size Cubs use the same mount, they are not interchangeable in this ship. Because the .099 is longer, the mount must be placed a bit farther back. Build and "fudge" the mount around the engine to give you the profile shown if you use a powerplant that differs from the one shown on plans.

Since the fuselage builds around a 1/16" keel, set this up first. The entire side view is its outline. Cut off the part for the upper nose section. Now form the landing gear. This must be sewed and cemented to the plywood, a safety pin being used to make the holes. Next, cement it to the keel and cement it thoroughly. Blocks A and B, plus former G can be put on, followed by the side sheets which bring the width out to the edges of former G. Blocks A and B must be a full 3/8" thick. We used 1/4" for the side sheets. Lastly, close in the front to the cowl opening, add the exhaust outlet block and stabilizer platform, *et cetera.*

Set up the upper nose section and mount the engine. Cut away former G and the keel at the front so that the fuselage is hollow back to the cockpit. Check this on the plan.

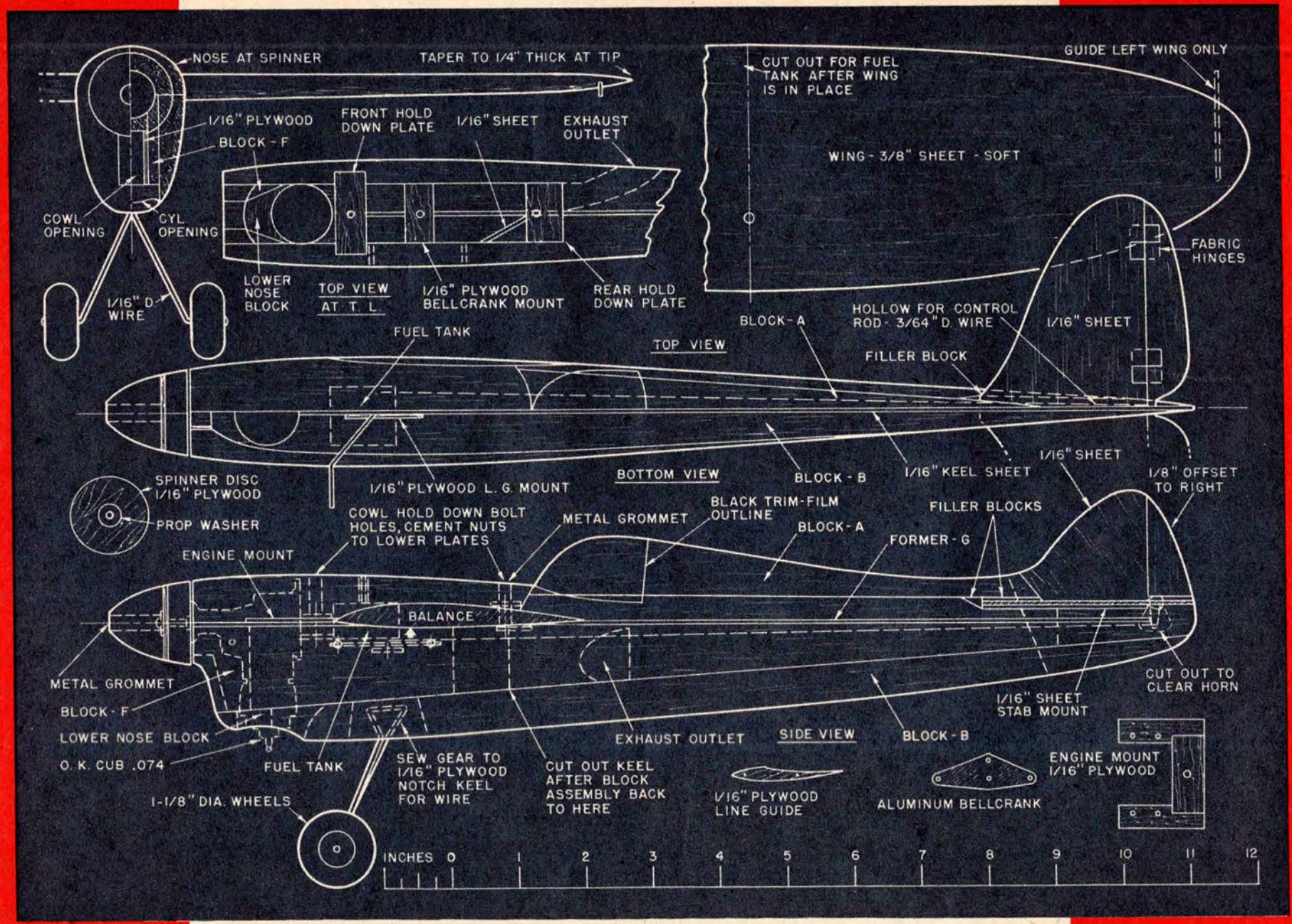
After all engine openings are taped shut, fit the Cub down into position. Cut out the inside for mounting lugs, fuel line, and the like. You don't want a tight fit—the nose piece must mount easily. Temporarily spot glue it in place.

Build the spinner to fit the propeller you intend to use. With it in place, work the whole fuselage down to final shape. Finish with fine sandpaper on a block. A little extra time and effort spent here will pay off in appearance.

After removing the upper nose piece, install the bellcrank mount and the hold-down nut mounts; also the exhaust ducting. Don't spare the cement. Now attach the stabilizer and elevator and finish the control system.

The wing is of solid construction. We made ours of 3/8" x 1½" stock glued together. Cut it to outline shape and taper the bottom toward the tips as shown; keep it flat—no curve from front to rear. Sand the top to airfoil shape, leaving nearly an 1/8" edge all around. Sand the lower face to a constant curve so that the edges meet. Give a coat of finish to harden the surface.

To get the wing in place, you'll need to cut away some fuselage. It must set in solidly at zero incidence, with no twist. Cement it. Cut away the upper nose section until it goes on O. K. (*Continued on page* 80)


NOSE AT SPINNER
TAPER TO 1/4" THICK AT TIP
1/16" PLYWOOD
BLOCK - F
FRONT HOLD DOWN PLATE
1/16" SHEET
EXHAUST OUTLET
COWL OPENING
CYL. OPENING
1/16" D. WIRE
LOWER NOSE BLOCK
TOP VIEW AT T. L.
1/16" PLYWOOD BELLCRANK MOUNT
REAR HOLD DOWN PLATE
CUT OUT FOR FUEL TANK AFTER WING IS IN PLACE
GUIDE LEFT WING ONLY
WING - 3/8" SHEET - SOFT
FABRIC HINGES
BLOCK - A
HOLLOW FOR CONTROL ROD - 3/64" D. WIRE
1/16" SHEET
FILLER BLOCK
FUEL TANK
TOP VIEW
SPINNER DISC 1/16" PLYWOOD
PROP WASHER
1/16" PLYWOOD L. G. MOUNT
BOTTOM VIEW
BLOCK - B
1/16" KEEL SHEET
1/16" SHEET
1/8" OFFSET TO RIGHT
COWL HOLD DOWN BOLT HOLES, CEMENT NUTS TO LOWER PLATES
METAL GROMMET
BLACK TRIM-FILM OUTLINE
FILLER BLOCKS
BLOCK - A
FORMER - G
ENGINE MOUNT
BALANCE
METAL GROMMET
BLOCK - F
LOWER NOSE BLOCK
O. K. CUB .074
FUEL TANK
1-1/8" DIA. WHEELS
SEW GEAR TO 1/16" PLYWOOD NOTCH KEEL FOR WIRE
CUT OUT KEEL AFTER BLOCK ASSEMBLY BACK TO HERE
EXHAUST OUTLET
SIDE VIEW
1/16" PLYWOOD LINE GUIDE
BLOCK - B
ALUMINUM BELLCRANK
1/16" SHEET STAB MOUNT
CUT OUT TO CLEAR HORN
ENGINE MOUNT 1/16" PLYWOOD
INCHES 0 1 2 3 4 5 6 7 8 9 10 11 12

HOT OFF THE WIRE

Puzzled by U-control growth? Here's our review of significant developments during past season

By S. CALHOUN SMITH

■ With 1950's contest ships taking their hard-earned rest, now would be a good time to take stock of all the events and ideas that have passed in parade.

As usual some contest goers probably found lots to complain about as far as rules are concerned, and it is evident that some flying developments have outgrown the rules. But by and large things went pretty well in 1950.

First, to the younger modelers goes the challenge for tomorrow's competition and development. The model ranks may be thinned considerably by departures of older members to the military services. There is a lot for the young modeler to tackle. Team racing has just gotten its foot in the door good by now, Half-A's are everywhere, even stunt has become the province of the very young. The awarding of top honors to seven- and eight-year-olds at big contests is now occurring frequently.

Performancewise, stunt has gone about as far as it can go. The popular combination of flaps and elevator control such as the Veco ships leaves little to be desired in ability to complete the full stunt pattern. A reasonably smooth-running engine and quick reflexes complete the requirements to win under present rules.

There has been a trend away from the strictly barn-door type of stunt ship. More attention is being paid to appearance and finish. More realistic profiles are coming into their own. Spinners, cowled engines, canopies, miniature pilots and wheel pants helped make the 1950 stunter a lot better looking airplane, without detracting from its performance. The extremely large 800-1000 sq. in. jobs have outlived their usefulness (we hope). Flyers have found they can do the same job with smaller wings and engines and that they do not need the overabundance of power and high speed that the big fuel-gobbling engines deliver.

Various schemes have been tried around the country to make it easier to judge the high performance of today's stunt flyers. Really sharp judging by expert stunt men is one answer, but this is not always possible. The much-discussed 24-stunt pattern used at the Mirror Flying Fair has been under consideration as a permanent rule change. Actually this would have little effect; it would be only a short time before a great many modelers could master all 24 maneuvers, which are after all simply combinations and multiples of the A.M.A. pattern. At last year's Mirror Fair it was decidedly evident, although this was only the second time the rules were used, that a high percentage of flyers could do the book. The only deterring factor was the very high wind, which will always mean trouble.

A system of bonus point awards in addition to regular A.M.A. scoring has been used by some groups in the East. This has served well to make the fine point difference needed to determine a winner. This system seems a logical step forward and may well prove a partial answer to the problem of stunt scoring.

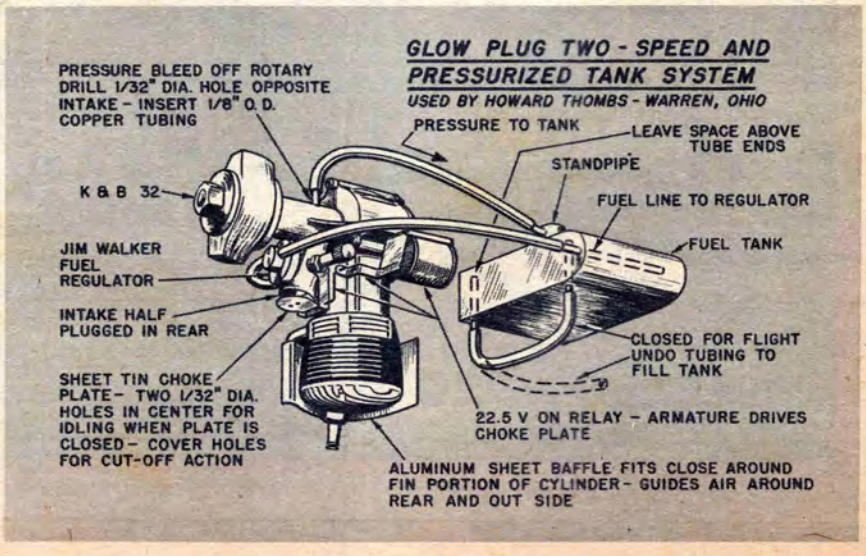
A parallel can be drawn here with free flight development through recent years. At first it was quite a job to milk any kind of performance out of poorly designed, under-powered ships. As design progressed and engines improved, the endurance problem was soon licked. Then we had to work backward to handicap later design by loading rules and even limit flights by using dethermalizers. A very similar situation has arisen in stunt. Design has progressed to where top performance is commonplace. Limiting factors will have to be imposed, otherwise a lot of modelers will lose interest in what will soon become pretty easy competition. There simply won't be enough of a challenge to the contest-minded flyer.

The secret of a good stunt performance is low wing loading. If a minimum wing loading rule were imposed it would put a higher premium on pilot ability and design. Unlike free flight, where the wing loading rule never worked too well because of the element of the lucky thermal, we believe it would work in control line. We can hear the clamor rising from the countryside already. There would be a lot of toes stepped on but we believe it would be for the good of the event. Even the addition of a minimum cross section rule would not hurt too much. A little more drag might serve to restrict performance slightly.

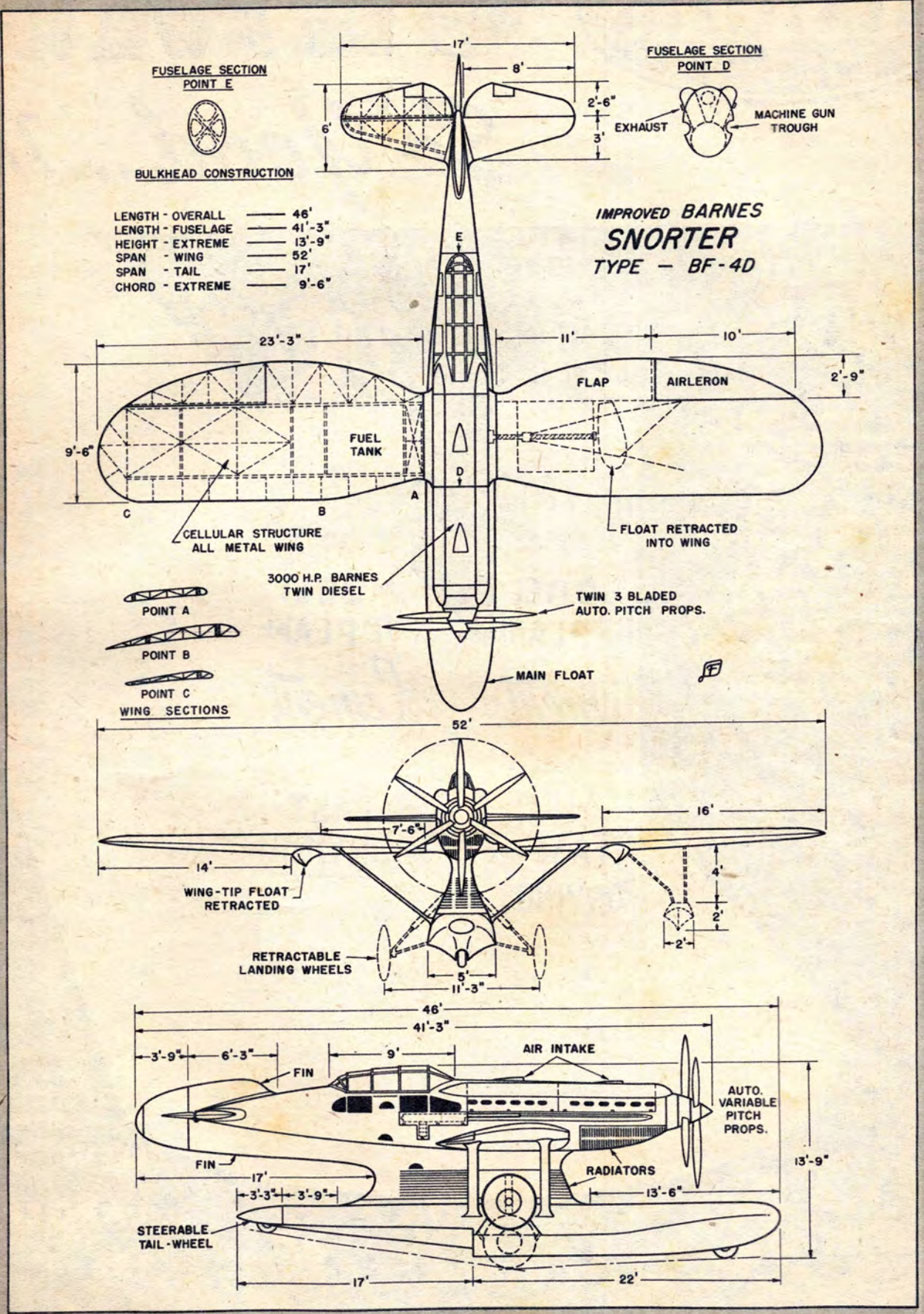
Speed flying showed many notable improvements in the past year. The use of standard wire sizes has held speeds down considerably but has helped lick the safety problem. It has also helped greatly toward smoothly run contests, when the rule was enforced. The development and marketing of the cast alloy speed pan has put strong durable models within the reach of a great many more modelers.

Developments such as deBolts' and Grish's pressurized tank systems will raise the level of performance for a greater number of speed competitors. Although records haven't tumbled by any fantastic amounts, speed flying still retains its ever-eager circle of enthusiasts. The word is well distributed on speed design; the factors are pretty well stabilized. Stock engines are making a good showing along with the feverishly re-worked hot irons.

What lies ahead in speed? Few will disagree that this event has just about reached the ultimate in development unless drastic rules changes (*Continued on page* 68)



BILL BARNES' AMPHIB FIGHTER



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So Good... They're

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- Formula A . . . extra-fast drying for quick, easy construction of light weight models; also for on-the-spot repairs.
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- Ask for Testor's Model Airplane Cements . . . insist on them . . . by *name!* At dealers everywhere . . .

NEW LARGER 15c TUBE

TESTOR CHEMICAL COMPAN

NT *and* DOPE

ire America's Largest Selling Line!

- Formulated by check-point dispersion control for superior quality.
- Unequalled for one-coat coverage . . . smooth, lustrous high-gloss surface . . . pure color brilliance.
- Available in a wide range of colors . . . including official Army-Navy aircraft colors.
- Developed in our own laboratory especially for model airplanes.
- Ask for Testor's Dopes . . . insist on them . . . *by name!* At dealers everywhere . . .

NEW LARGER 15c BOTTLE

NY • ROCKFORD, ILLINOIS

VOUGHT F7U CUTLASS

Step-brother to the Flying Wing, blood brother to an angry rocket, this novel Navy fighter will play a big role in America's air effort

■ Navy's white hope among its current stable of red-hot jet interceptors is the Vought F7U Cutlass, a weird-looking but terrific-performing fighter. This new jet is the opening wedge in the Navy's assault on the enormously complex problem of operating the transonic fighter from a carrier deck—but most of the solutions are already clear: it *can* be done!

The Cutlass is the Navy's first swept-wing combat airplane and represents Chance Vought's bold bid for leadership in this exciting but difficult new field. Navy's first wave of jet carrier fighters stuck religiously to the straight wing with its well-known high-lift and good stalling characteristics. McDonnell's successful FH Phantom and F2H Banshee and Grumman's sleek F9F Panther all followed this dependable planform in to long production lines. Chance Vought entered the new jet field in September 1946 with its F6U Pirate single-jet fighter featuring Metallite construction. Along with North American's FJ Fury, the Pirate played an important role in the Navy's experimental days of jet operation aboard carriers, but the F6U never saw the production line.

The No. 3 Pirate was used in a forward-looking experiment, however—the application of the Solar afterburner to the Westinghouse J34 turbo-jet engine. This simple shell of stainless steel provided an increase in thrust of 30 percent for take-off and 50 percent at best altitude and speed. Flight tests with this Pirate proved that here was an extremely light and simple device which Navy and Vought engineers could not overlook in future design —and that meant the F7U Cutlass!

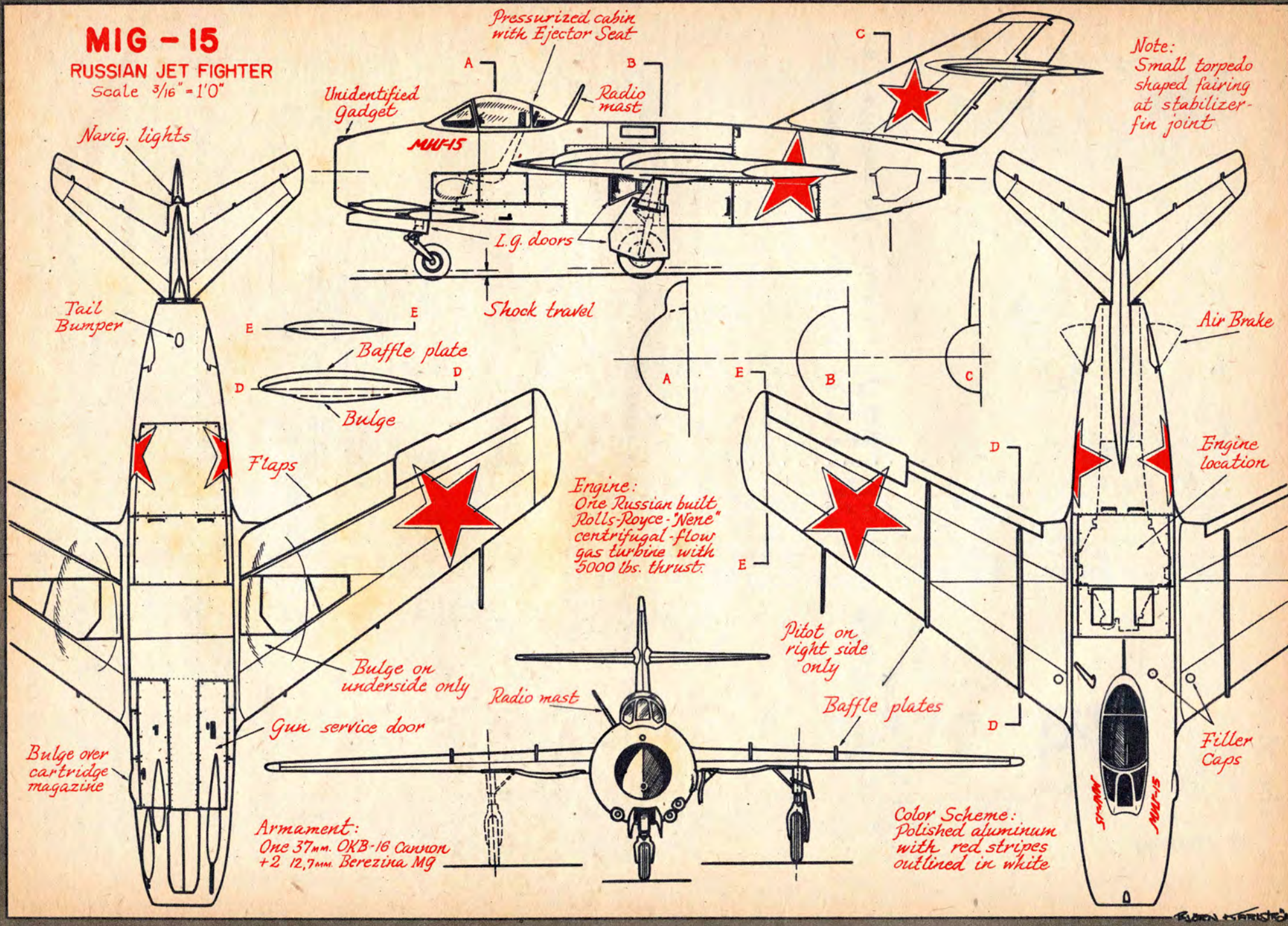
This deadly new interceptor began life way back in January 1946 (nine months before the F6U had flown!) when the Navy Bureau of Aeronautics invited bids on a 600-mph, 40,000-ft. interceptor. Vought. Grumman, (*Continued on page* 68)

In the Cutlass the Navy has a formidable weapon with a rocket-like climb. Note high angle of attack plane assumes on the ground.

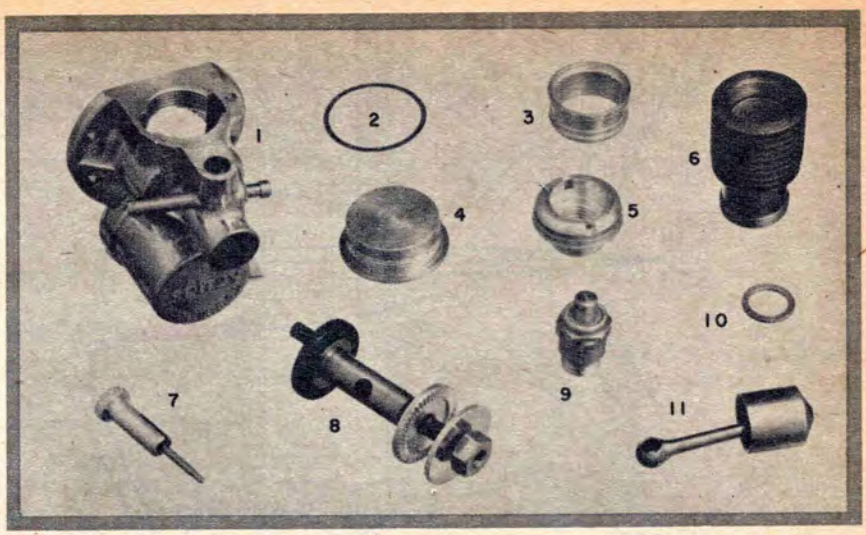
MIG - 15

RUSSIAN JET FIGHTER

Scale 3/16" = 1'0"



Motor of the Month



SPITZY

A brother to the Baby Spitfire, this powerplant comes from classy family

■ Mel Anderson's Baby Spitfire is a couple of years old and now boasts a baby brother, the "Spitzy." This newer engine has a piston and cylinder similar to the original Baby Spitfire with a new base containing a built-in fuel tank.

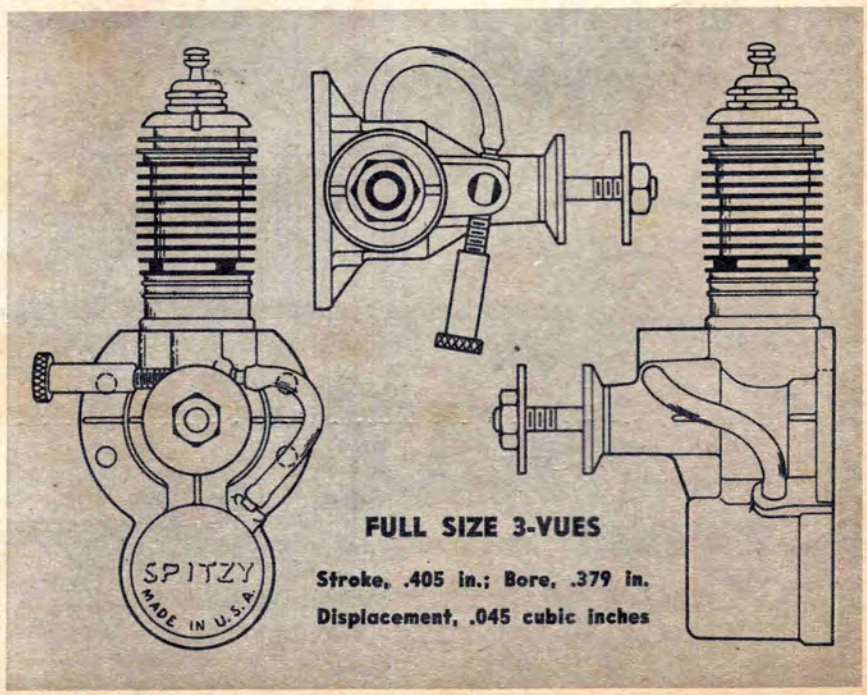
The great increase in popularity of Half-A engines has brought many newcomers to the gas model field, and the Spitzy kit, selling at an exceptionally low price, fits many demands of these new fans. A complete line of accessories including propeller, glow plug, wrench, mounting bolts, and glow plug clip are supplied in the kit. The engine is designed for easy starting and long life, with best performance in the medium speed range.

High-speed engines adapted to racing are usually more sensitive and difficult to handle, but this condition has been avoided in the Spitzy. The base casting containing the fuel tank has a rugged radial mount making it practically crash proof. Performance tests show a good fuel level test indicating the engine will run very steady in the air with any reasonable care in adjusting the needle valve. Ample finger room is provided by extending the needle valve and tipping at an angle.

Free flight fans, whether beginners or well experienced, should like this combination of features. The built-in fuel tank gives one and one-third minutes engine run, and maximum power is developed in the medium speed range most commonly used for free flight ships. Radial mounts are also very popular with the thermal hunters.

The inside of this engine is of special interest. Instead of an aluminum connecting rod with a ball and socket joint at the piston, the Spitzy is fitted with a rugged hardened steel rod held in the piston by a steel snap ring. This should give long life at both ends of the rod. The hardened steel piston and steel cylinder are similar to the average miniature engine. Porting is identical to the original Baby Spitfire. Fuel passes from the base of the engine through two bypass slots in the base casting into an aluminum sleeve around the lower part of the cylinder. From here the fuel goes through three intake ports into the cylinder.

At the beginning of the engine test some difficulty was encountered, and the cure may be of use to modelers owning a Spitzy. First attempts to start the engine resulted in a lot of popping, but the engine wouldn't give a burst and start running. This was due to a combination of close-fitting piston and high compression causing the engine to fire too soon. This condition can be verified, if it exists, by (*Continued on page* 71)



FULL SIZE 3-VUES

Stroke, .405 in.; Bore, .379 in.

Displacement, .045 cubic inches

Jim Walker FIREBABY

The Plane You Buy Already to Fly

All parts of the Firebaby are completely finished, painted, and fuelproofed. Just slip them together, bolt on wing and motor and you're ready for the take-off!

The Firebaby has a span of 19" and weighs only 3 oz. with any "½-A" motor. Special "slow motion" propeller included so you can learn to fly gradually without dizziness. Complete with flying lines and flight instructions.

$7.50 with motor

Without motor $2.50

For More Flying Fun . . .

A-J FIREBALL

The original U-Control plane. High maneuverability for stunt flying. Kit includes control handle, flying lines, wheels, everything but motor and liquids. **$6.95**

FUEL REGULATOR

Supplies fuel under pressure in any flight position until the tank is dry! Comes complete with Jim Walker Pressure Tank..... **$2.50**

U-REELY CONTROL

Keeps your flying wires off the ground and ready for instant use. Make quick take-offs unassisted and reel in to land. Single strand steel control wires..... **$7.50**

With stainless steel cable lines.....**$8.50**

America's Favorite Ready-to-Fly Planes

"74" FIGHTER

Does 19 different stunts with ease. 12¼" cambered wing, smooth streamlined fuselage..... **10¢**

A-J INTERCEPTOR

Folds its wings for launching, automatically spreads them to soar. 16½" cambered wing. Complete with launching stick..... **50¢**

A-J HORNET

Will R.O.G. and fly 500 feet! Unbreakable plastic prop, 18" cambered wing, heavy duty rubber motor..... **50¢**

CEILING WALKER

This helicopter flies straight up and hops along the ceiling. Outdoors it climbs straight up 'til unwound, then does acrobatics on way down..... **25¢**

Jim Walker **A-J AIRCRAFT CO.**

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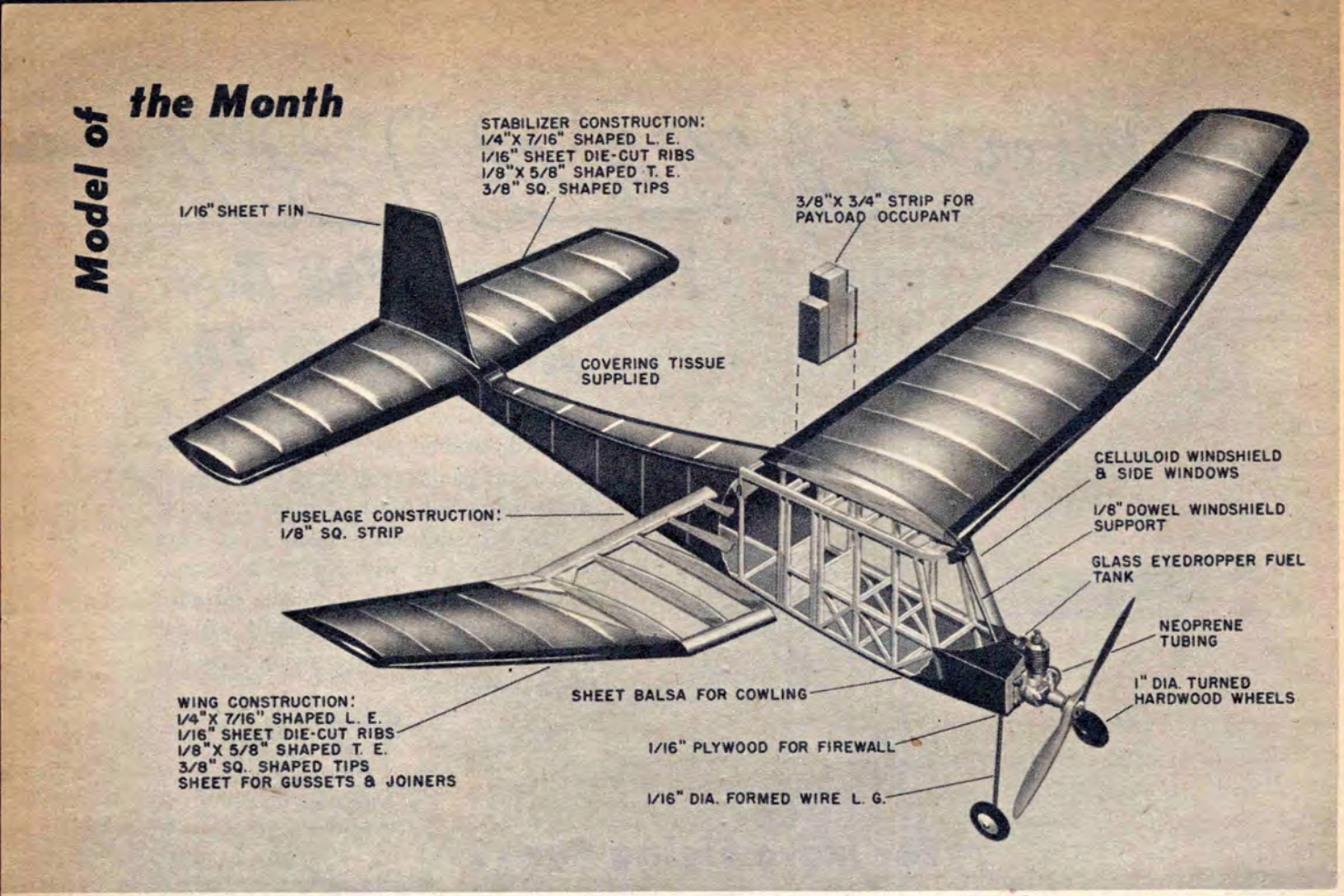
World's Largest Manufacturer of Ready-to-Fly Aircraft

Model of the Month



Lift Master

The guy who flies in this ship is a real dummy, honest

■ The idea for this month's model was born last spring when Pan American World Airways announced that *if* enough interested modelers appeared at the Dallas Nats, *if* they had enough Half-A payload ships ready to fly, *if* the harassed contest manager could fit the event into an already crowded schedule—well, anyway, PAA was willing to sponsor an experimental Half-A PAA-Load contest, and, what's more, they would provide substantial prizes. Maybe it was that last item, but at any rate the interest was surely there.

The next heard of Half-A payload was at Dallas when the experimental event was conceded to be a tremendous success. It was won with a time of 13:16.0, highest of *any* PAA-Load event at the meet! The winning ship was designed and flown by Frank Ehling, and modified and improved, is now being marketed in kit form by Junior Aeronautical Supply Company (Jasco, to all knowing model builders), 203 East 15th Street, New York 3, New York.

Following the Nationals flying of the midget payload event, and several other trials around the country, a poll of many modelers was held to settle upon a final set of rules. The main change decided on was a bit of alteration in the "occupant" or dummy, which forms the entire payload the ship must carry. In view of the high times made with the original 1.5 oz. dummy, it was the consensus of opinion that the little ships should really be put to work. Some flyers even suggested 5 or 6 oz., but the final weight selected was 3 oz.

As soon as the Nats event had

been announced, Ehling set about designing a ship for the event. He had success right from the beginning, culminating in his top PAA-Load Nationals win. Frank, just for those few who don't know him, is one of the top contest flyers of all time, though you'd never guess it to talk to him. He now staggers about under the formidable title of "Chief Design Engineer and Test Pilot" at Jasco, and many of his creations have already been added to Jasco's long-famous line of glider kits. Jasco has produced a kit that goes together easily, considering the requirements, and gives top performance when properly handled. This is not one of those super- prefab kits that assembles itself automatically when you remove the box lid and dump out the contents. It's not intended to be, for this one is not aimed at the rank beginner (who shouldn't be starting out with a hot contest ship, anyway) but at those with a reasonable amount of modeling savvy.

One of the first things to strike you as the box is opened is the beautiful wood you get, but this is to be expected, for Jasco is one of the pioneer balsa-cutting concerns in the country and has long been noted for the quality of wood supplied. Looking into the wood situation a little further, you'll find the grades are selected as required; for example, the ⅛" square fuselage material is all hard grade. It needs to be, for that occupant is a real load; you realize this when you discover that, not including the dummy, the finished airplane ready to fly weighs only 5 oz. or so.

As noted earlier, the Lift Master is not the (*Continued on page* 82)

Woman's Angle

(*Continued from page* 10)

training, upgrading, training for foremen and supervisors and technical training—on an equal basis with the men.

Government-financed courses were given on a college level for blueprint reading, use of measuring tools, knowledge of metals, drafting and laboratory work. Some gals went ahead toward an aviation engineering degree.

Even today, the girls are still working at the interesting jobs that came out of the last emergency. We know some who are tech-order manual writers, aerodynamicists, stress analysts, draftswomen, and engineers.

Apart from the manufacturing end of things, many other jobs in allied aviation were held by women in a civilian capacity. As a result of a special training program offered by government and industry combined, many gals became Link operators. They pored over a hot table all day watching a little "crab" plod slowly over a mapped, hypothetical course of flight. This took knowledge of the instrument-trainer itself, and what the instruments meant and did. It also required a knowledge of radio ranges, beams, and the effects of turbulence and high winds on actual flight-maneuver planning and preparation—to say nothing of some fancy arithmetic.

Some were meteorologists for the airlines or CAA airways weather stations. This required scientific training in weather characteristics, symbols and sequences. Careful study of weather "brewing" was needed to plot weather maps complete with isobars, fronts, and station symbols.

Control-tower and radio operation jobs were attractive to the girls, and they did a good job of it—what with all that natural equipment in the conversation department! A clear concept of time, space and airplanes had to be learned as well as an ability to deliver loudly and clearly all pertinent information required by pilots. Intelligent transmission of weather information, past, present and future, field conditions, traffic in the vicinity, etc., were highlights of these positions.

On most fields—military and civilian—the parachute departments were "manned" by women. These expert pattern cutters and sewers made, packed, and rigged the most complicated parachutes expertly.

On the flight line itself were the girls who had sufficient previous actual flying experience to become flying instructors. The gals instructed Air Force and Navy cadets on the civilian contract programs in the primary and even basic stages of flight training. Their aviation background was either evolved through the CPT (Civilian Pilot Training, in which a small percentage of women was allowed to participate), or through their own efforts (cash money). They had commercial licenses, of course, and rapidly checked out on the higher horsepower ships used for military training, such as the Stearman and Fairchild PT-19, and BT-13.

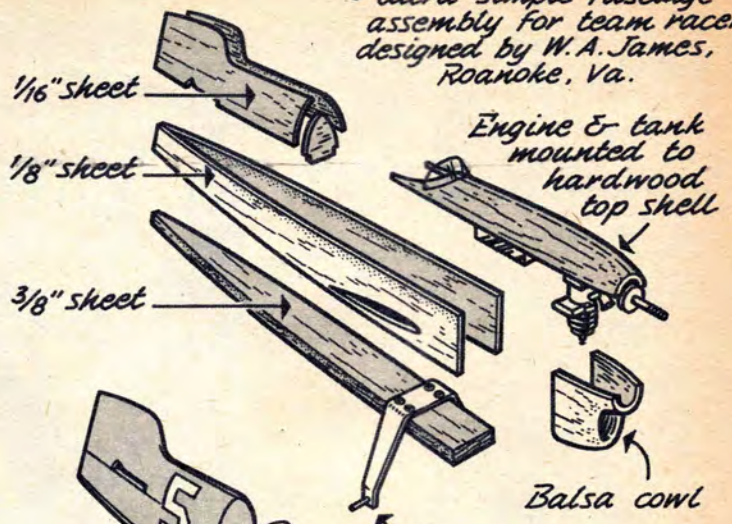
In all, it was a great surprise to the men and a great opportunity for the women. They broke the ice in a former "for men only" field. They've proved by the thousands that they have ability and talent. They can be counted on to be ready, willing, and able to do, learn—and help.

—NONIE HORTON

sketchbook

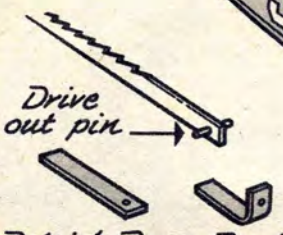
Have you developed something new in construction, control, or flying that might interest other modelers? Send a rough sketch—we'll redraw it and pay $5 for each one accepted. Due to their large number, we're sorry that we cannot acknowledge or return submissions.

• Ultra-simple fuselage assembly for team racer designed by W. A. James, Roanoke, Va.

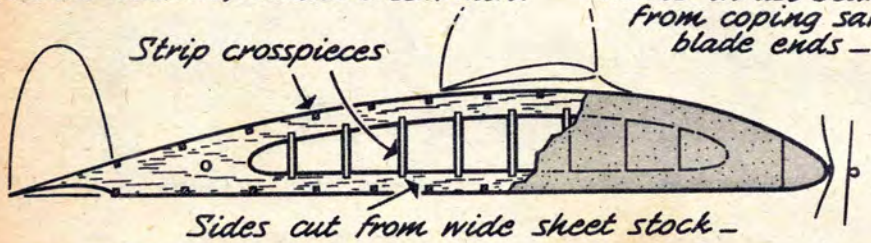


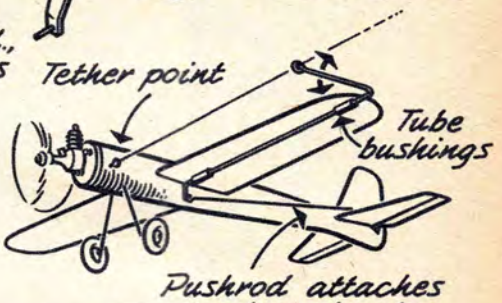
Package of cigarette paper fits handily into tool kit...

• Make quick field repairs to covering with cigarette paper—Robert Lincoln, Smiths Creek, Mich.

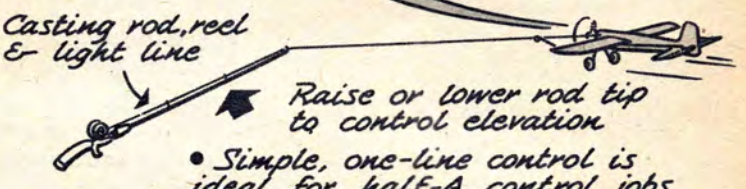


• Patrick Ryan, Bowie, Md., makes thrust bearings from coping saw blade ends—





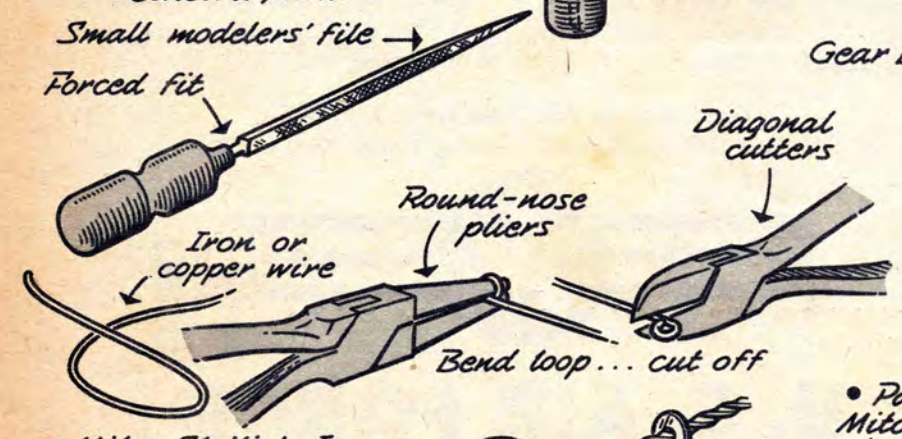
• Simple, efficient construction of fuselages for rubber and small gas jobs developed by Robert Bentzles, S. Bend, Ind.

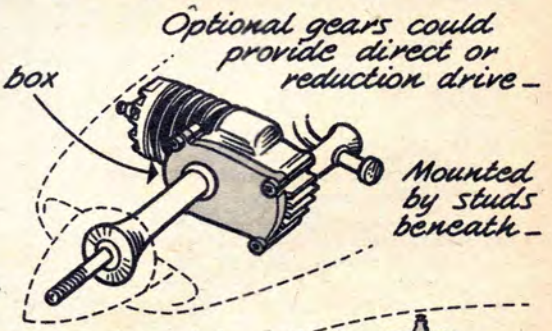


• Simple, one-line control is ideal for half-A control jobs reports Dave Doty, S. Bend, Ind.

Pin hole vent in top

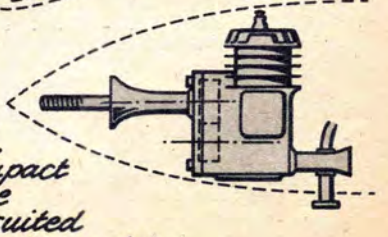
• Handy uses for empty CO_2 capsules by thirteen-year-old Dana Call, Concord, N. H.





• Mike Strilich, Jr., Pueblo, Colo., makes washers to fit particular jobs—

• Paul Tobin, Mitchell, S. D., visualizes compact geared engine particularly suited for cowled scale models—



PILOT'S CHOICE

FLY A CHAMPION!

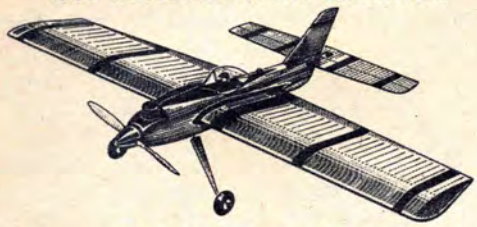
...CHOOSE TRIXTER – ONE OF THE LEADERS IN CONTROL LINE STUNT FLYING

designed by *Lou Andrew's*

1950 NATIONAL OPEN STUNT CHAMPION
1948 INTERNATIONAL OPEN STUNT CHAMPION

ITS PERFORMANCE THAT REALLY COUNTS

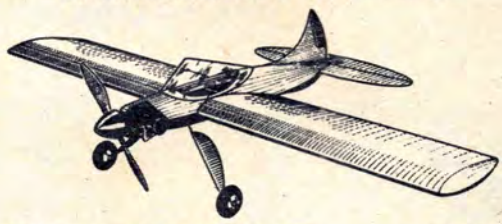
1950 NATIONAL STUNT CHAMPION



Trixter BARNSTORMER $5.95

1st in Senior Stunt Event - 1st in Open Stunt Event - 47" wing span - 470 sq. in. wing area - .23 to .35 cu. in. disp. Kit contains full size plans, illustrated step-by-step instructions and complete pre-fabricated parts for quick assembly.

'48 INTERNATIONAL STUNT CHAMPION



Trixter INVERT JR. $3.95

'48 Plymouth Stunt Champion - 40" wing span - 300 sq. in. wing area - .23 to .49 cu. in. disp. Pre-fabricated kit, full size plans with plenty of detail; picture type flying instructions showing everything from take-off to 4-leaf clover.

2 NEW ANDREWS DESIGNED STUNT JOBS — THEY'RE TERRIFIC!

CLASS 1/2A

BABY BARNSTORMER

Half-size version of champion Barnstormer for 1/2A engines - 23½" wing span - 118 sq. in. wing area. Flies like a dream on 25' to 35' lines. A stunt job that does everything in the book. **$2.95**

Available at your favorite dealers soon — ask about them!

.19-.29 CU. IN. DISP.

PROFILE TRAINER

Our Profile basic trainer with readi-shaped all balsa wing, shaped balsa fuselage and die-cut tail surfaces. Ideal for beginners - no difficult construction. 32" wing span - Class A-B **$4.50**

TOPS IN VALUE — TOPS IN QUALITY — TOPS IN PRE-FABRICATION — TOPS IN FLYING

Sensational DIE-CUT BALSA

FLYING SCALE AND SOLID SCALE MODELS

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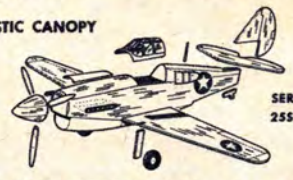
EASY TO ASSEMBLE

12 SCALE SHELF MODEL KITS: 7 military: F-86 Sabre, F-84 Thunderjet, P-51 Mustang, P-47 Thunderbolt, P-40 Warhawk, Fokker D-7, & SE-5. Sport airplanes: Monocoupe, Cessna, Piper Cub, Aeronca & Stinson. **10¢**

PLASTIC CANOPY



SERIES 25SDC

12 SCALE SHELF MODEL KITS. 11 military: Banshee, Corsair, Skyraider, Thunderbolt, Shooting Star, Mustang, B-29, Warhawk, Thunderjet, Sabre & Lightning. 1 transport: Constellation. **25¢**

SERIES 25DC

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EASY TO FLY

9 ALL BALSA FLYING MODEL KITS (DIE-CUT). Your choice of high and mid wing monoplanes and of two biplanes. Simple construction - plastic propeller for better flying. Cambered wings. **25¢**

TISSUE-COVERED SCALE FLYING MODEL KITS. The formers, ribs and tip outlines are die-cut from sheet balsa. Most of the parts are printed for easy identification. Save hours. **50¢ — $1.00**

TRIXTER *PROFILES*

Universally acclaimed "tops" among control line stunt flyers. Easily assembled from pre-fabricated parts. Rugged construction for many hours of flying.

CLASS A-B	CLASS B-C
32" wing span - 250 sq. in. wing area - .19-.45 engines **$2.50**	38" wing span - 350 sq. in. wing area - .29-.51 engines **$3.50**

OTHER GUILLOW ITEMS AVAILABLE.

BALSA GLIDERS: P-84 Thunderjet 5¢, Air Ace 10¢
GLIDER FLEET: (3 gliders per box) 10¢
READY-TO-FLY MOTORPLANES: 12" Skystreak 25¢,
PROFILE MOTORPLANE CONSTRUCTION SETS:
Series 11F- 6 models- sheet balsa - 10¢ per kit.
ALSO - 10¢ Solid Model Kits (Series 10S), 25¢ Solid Model Kits with profile-cut fuselages (Series 25S),
TISSUE-COVERED FLYING MODEL KITS: Series 10F - 10¢ and Series 25F - 25¢. 1/2A GAS MODEL KITS, both STUNT and SCALE, as well as 1/2A FREE FLIGHT KITS.

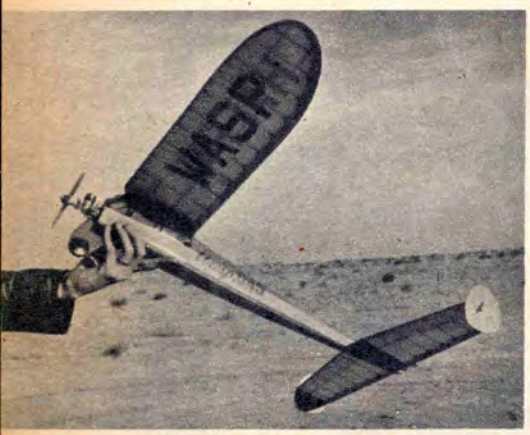
SEND FOR CATALOGUE AND PRICE LIST.

PAUL K. GUILLOW, WAKEFIELD, MASS.

WESTERN ROUND-UP

Bill Daniels' nine foot *Gool* is shown taking off at a Camp Haan contest. Note excellent flying country in background—flat, no trees.

For latest scoop on West Coast doings follow Dick Everett's reporting here



Bob Wiehle's contest winning Half-A payload job. Model powered by you-guess-what has excellent performance.

Larry Goodale hard at work on his twin Torp 32 powered stunter. Ship weighs 5.5 lbs., has bubble, tricycle gear.

Little flyer with big ship. Bob Ehrhardt of San Diego with a Davis *Hogan*. McCoy 29, turned-down "35" piston.

■ One of the most unusual clubs ever formed, to the best of our knowledge, is the *San Bernardino Flying Wheels.* They figure that to have a good club you must have the items, to wit: 1. A congenial group who are interested and active. 2. It should not be so large that the punch is lost through disagreements and quibbling over policies et cetera. There must be a common goal—and in this case it is to fly and win contests.

The "Wheels" have a total of two officers and only eight members. Wally Short, current Class B record holder, is president, with Ray Newman as acting secretary. By keeping the group select (not snobbish, for sure) they are able to dispense with formality at all meetings. They have none of this "May I have the floor?"

This question usually brings an answer, "Yes, if you bring it back," while "Will the secretary read the minutes?" elicits a solemnly entone "One . . . two . . . three . . . four. . . ."

And if a member misses either three meetings or three contests, no matter where the contests are held, he is sent a letter asking him to please refrain from wearing the club shirt and informing him that he is no longer a member. Some club! Maybe that's the reason they do things in a big way.

The *Flying Wheels* recently held the contest of contests. For their first Annual Meet, the club members, thinking along the same lines as the famous *BrainBusters,* decided that to run a first-class meet they would have to dispense with flying themselves, so they did not enter. They went out and rustled up so many prizes that the 112 contestants were not enough to take them all home. There were no lines for processing, no lines for flights, and the only line-up was for the prizes. The spectators were *kept* back in a roped-off area, and the twenty timers were more than enough for the mass of contestants. All told, it was very well organized. The *Flying Wheels* deserve the praise that has been given them. The winners are as follows:

Half-A 1st, Bob Wiehle, 14:54.7; 2nd, Karl Widner, 14:05.2; 3rd, Nat Antonioli, 13:35. Class A: 1st, David Converse, 12:15.5; 2nd, Jack Block, 12:12.9; 3rd, Tom Mankey, 10:14.1. Class B: 1st, Larry "Volume Deal" Boyer, 16:18; 2nd, Gary Ball, 16:03.4; 3rd, Carl Croissant, 14:34.1. Class C: William Daniel, Jr., 18:35.2; 2nd, Lyle Corbly, 16:24.1; 3rd, David Converse, 12:35.2. By virtue of his first in Class A and the third in Class C, David Converse was awarded the huge Sweepstakes Trophy. Dave is from Santa Monica. Gary Ball was awarded the beautiful Junior Sweepstakes Trophy. Gary hails from San Diego. For the beauty event, Toshi Matsuda had one of the most beautiful free flight ships ever to make its appearance on the Coast.

In the way of what might happen at all annual contests, the *Bakersfield Gas Model Association* tried a new and very interesting experiment, one which proves that fellows like to fly. At their Semi-Annual they had rubber and towline gliders on Saturday afternoon, with the gas events, including all payload events, on Sunday. The experiment was very much a success with quite a few lads showing up for the two-day event. Manny Andrade and Joe Bilgri came down and ably represented the *Oakland Cloud Dusters.* Roger Jenson, Ross Johnson, "Camp Stool" Peterson, and others of the *Thermal Thumbers* and Harv Patton and yours truly of the *Aeroneers,* with all the local gents—it was quite a meet. Saturday was the perfect (*Continued on page* 76)

Precision Built for better performance

The accuracy and craftsmanship that go into every Scientific model pays off in performance. The use of quality materials — and even more important — the skilled workmanship of men who take pride in the work they turn out, account for the ever increasing popularity of Scientific kits. This plus the most rigid inspection of all finished parts is your assurance of satisfying performance. Put any Scientific model "through its paces" and see what we mean.

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SCIENTIFIC MODELS ARE Tops IN ANY COMPETITION!

ALL KITS COMPLETELY PREFABRICATED

HALF-PINT RACER
.020 to .074 Engines
$2.95

CO_2 SQUIRT
CO_2 or "½A" Engines
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BUCKEYE SPEEDBOAT
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18" Wing – "½A" U-Control
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LITTLE DEVIL
18" Wing – "½A" U-Control
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PIPER CUB Special
22" Wing – "½A" U-Control
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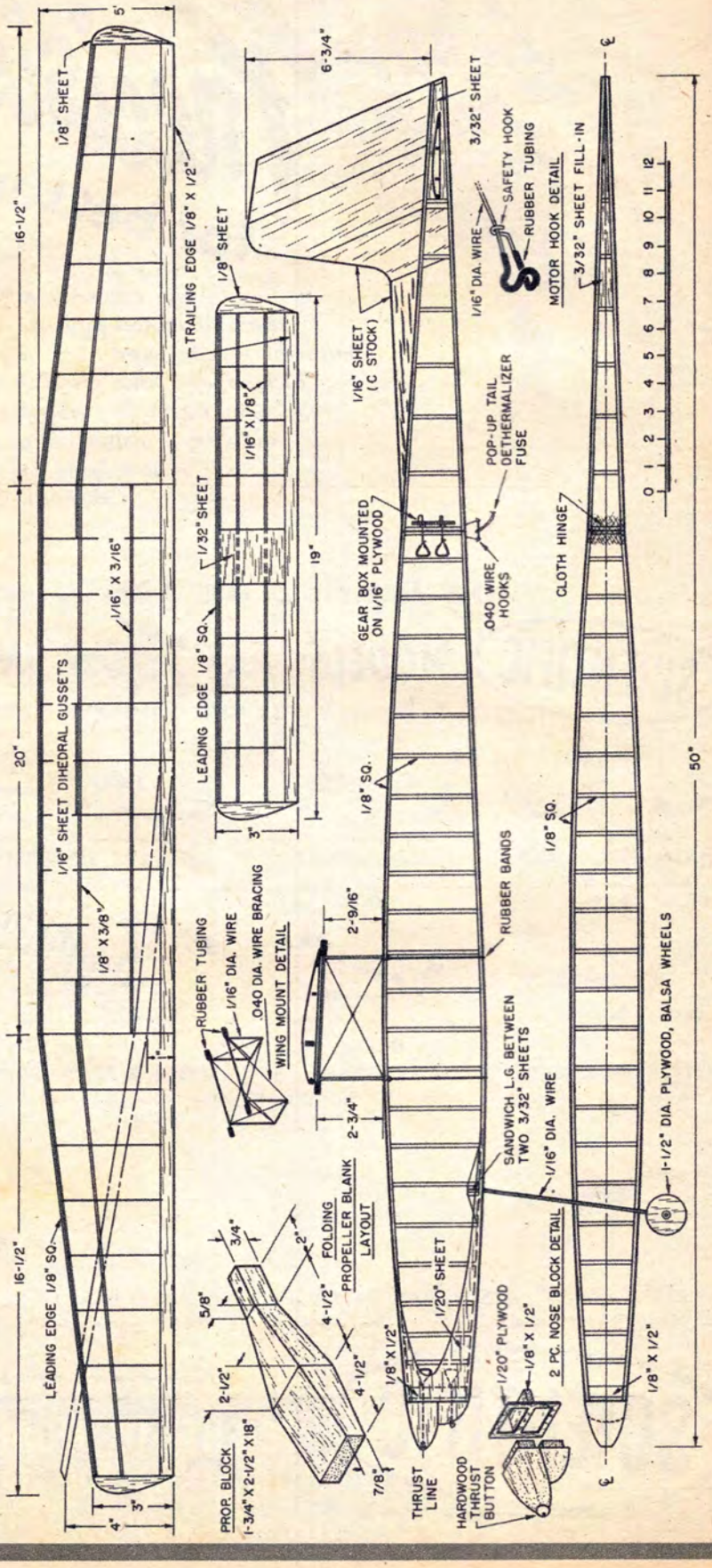
SEE THESE AND OTHER SCIENTIFIC MODELS AT YOUR FAVORITE HOBBY SHOP

PLAN FORM OF THINGS TO COME

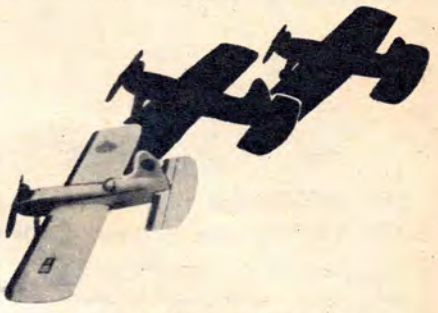
Here is Frank Ehling's conception of what we will see in Wakefield flying this year. Most of the pertinent features of this remarkable design are discussed in article which begins pg. 50. Working plans available on AT Plan #351.



FOR YOU, MR. "AVERAGE MODELER"!
dmeco's NEW
All American Models

A progressive series from the TRAINER to the "SUPER STUNT" model, all design-engineered around America's TOP engines!

The pick of America's finest engines chosen because they do the job best, PLUS the world's finest designed models makes an unbeatable combination, dmeco's "All American Models".



IS THE
All American TRAINER

Designed for learning with the easiest engines to use, the O.K. Cubs. Rugged, and flyable to teach you the easy way.

Kit is ready to assemble with shaped wing, fuselage and tail parts. Follow the full size plans, glue it together and it is ready to fly!

BUILD IN 2 HOURS KIT $1.75

The "Junior" is designed around the O.K. Cub and McCoy "9" engines which gives it that snappy performance so necessary for stunt training.

- ★ Grade A1 Materials
- ★ Machine Shaped Ribs
- ★ Finished Wing Parts
- ★ Shaped Tail
- ★ Full Size Plans
- ★ Finished Fuselage Parts
- ★ Hard Maple Mounts
- ★ Shaped Cowl Blocks

NOW! HEADING YOUR WAY THE
All American Jr.
STUNT TRAINER

Learning to fly stunt is simple with this proven model, its the right combination of airplane, engine and accessories. It has been design-engineered so that it is slow enough to learn with and yet responsive enough to keep you out of trouble, a *real* stunt trainer!

Specifications
Wing Span: 26"
Wing Area: 140 sq. in.
Length: 13½"
Design Weight: 6½ oz.
Speed: 50 to 60 mph.
Ready for assembly $2.50

"America's Finest Models"

SPORT—STUNT—SPEED—"½A"

"SPORTWING"
An unusual sport model or a "hot" stunt job when powered with .19 engines. A tried and tested design of marvelous stuntability.
Finished parts $3.95

"New BIPE"
The trainer that over 20,000 flyers have learned with! Exceptional performance with an Ohlsson "23".
New Pre-fabed kit $3.95

"International Champion"
"STUNTWAGON"
America's finest stunt model, winner of contest after contest where the going is the toughest! A really fast and hot contest ship that will put you way out ahead of the rest of the field!
America's finest stunt kit $7.95

Stuntwagon "30"
A smaller version of the "Stuntwagon" for use with the "B" class engines, tops in its class!
Finest materials, pre-fabed $5.95

"National Champions"
Speedwagon "20"
The "20" was National Champion in '48 and '49 powered with a McCoy .19 engine. Highest speed in "A" ever recorded (128.5 MPH) was made with this model!
Ready to assemble $3.95

Speedwagon "50"
The National Champ and record holder, this kit sets a new pace in speed model design with its robust yet light weight construction. 162.54 MPH for a new 1950 National record!
America's finest speed kit $5.95

Infantwagon
A small all balsa version of the Stuntwagon for the .02 to .09 engines, ready to assemble in one evening.
Kit $1.95

Speedster
This design puts the "fun" in team racing, all the features of the big ones in a "½A" model.
Finished parts ready to assemble $2.50

Ask your Dealer to show you any "dmeco" Model today!

The deBolt MODEL ENGINEERING CO. WILLIAMSVILLE NEW YORK
"Home of Design-Engineered Models"

Sikorsky

(*Continued from page* 28)

method of transportation, and will evolve the technical demands for the performance of the vehicle. These demands eventually will be satisfied by the designers and builders, and the result will be the helicopter of the future.

Aside from the military development, what pattern of growth do you think that the helicopter will follow?

Mr. Sikorsky: "The helicopter's pattern of development is a lot more logical than that of either the automobile or the fixed-wing airplane. To date, there is no appreciable personal or sport use of the craft. Because of the nature of the vehicle, it is usually professionally operated for serious purposes. It is currently being used as a police-emergency vehicle, for exploration and for short-range transportation. It is singularly effective for crop-spraying and for mineralogical survey work.

"These, however, are offshoot applications of the unique performance possibilities of the helicopter. As serious transportation, I see two lines of development. First, cross-country transportation in jungle and back-country operation, where the obstacle to be overcome is the nature of the terrain rather than straightline distance, where it is impractical to build and maintain the airstrips required for fixed-wing airplanes. Closer to our cities, I see the development of air-taxi service over the

(*Continued on page* 88)

Wakefield

(*Continued from page* 50)

longitudinal stability. We employ gears to get the most out of the long rubber.

AT: Where could someone get gears such as you have used? Do you have any recommended sources?

FE: These gears were made by Tom Murphy of 1702 Woodbine St., Brooklyn, N. Y. He does an excellent job; these gears turn smoothly and there is practically no power loss in the transition.

AT: What do you think that the Wakefield models at the '51 finals will look like? Pretty much along these lines?

FE: To predict someone else's designs is quite hard. However, if everyone tries to get maximum motor run, all fuselages will have to be long. If one wants to get maximum wing area, he'll have to use a small stab. Of course, a lot of fellows don't like to do this. The rules probably were changed to allow larger stabs since many contestants in the past have kicked about the small stab area.

AT: Are last year's Wakefield designs obsolete? Will we have to start in all over again?

FE: It's hard to say—and for this reason: The winning Finnish model wasn't an unorthodox design and yet it did good time much better than anyone else.

AT: How about the fact that Aarne Ellila had better covering protection than most of the boys flying in that fog with its moisture-laden air?

FE: Moisture protection is simple. You can apply a light coating of shoe polish, or use fuel proofer over dope. But I believe Ellila's success was due to the fact that he was flying much slower and had better control of his model than the rest of the contenders, and that's exactly what we're doing now. We're flying our new models much more slowly. This model is not underpowered in the sense that it has only a few strands. It has low power due to the fact that the cross section of the rubber is extremely small. Rather than shooting for fast-climbing, thermal-sniffing performance, you must remember you are flying in another country and you have to make up your mind that entries must have a long climb and turn in a better glide.

And another thing—with this long type tail moment arm you get a very steady glide which wouldn't do well in windy weather or under thermal conditions. We use a large rudder to keep the direction of the turn constant, to avoid dipping or stalling or any disturbed flight. To win in Finland, your model must turn in a flight like an indoor glider.

AT: Frank, tell us how you feel the American eliminations or qualifying rounds should be run off to give the boys experience for flying in the finals in case we are fortunate enough to get a team to Finland. What time of the day, for instance, or what time of the year should we run off the meets?

FE: The elimination meets should be run off as quickly as possible so that the builder who knows he is going across can make a model that will be able to fly under those conditions abroad. We should also try not to hold these contests on the best thermal days we can find, or even in the daytime. Let's hold them close to evening, or if possible early in the morning, so we can end up with models that will prove their worth in the international finals. Let's not count any thermal flights during the qualifying rounds—any flight in which the model is elevated above its normal position.

Let's get some *true* climb-and-glide models. Then we will have our best chance. With low-powered models, it will be much simpler to adjust them. You don't have to worry about extreme offset in thrust or extreme downthrust. Your power curve will be constant. You won't have to worry about getting the model off in a steep bank or one wheel taking off before the other. It will just be a case of winding the model up fully. And that's the whole "kick." Since the rubber motor is long and you're using a low-pitch prop, she'll turn over faster than a high-pitch prop, but it won't be doing the work as fast because you are going to have maybe two minutes of power run all the way up.

AT: How much power do you anticipate putting into this model?

FE: We're using four ounces of rubber and no slack. The slack will be kept out to make sure that the C. G. doesn't shift once you balance the plane. That is most important. The wing mount is also an important feature. If the weather is damper when you're flying than when you test-hopped, the wing can be moved back without difficulty. That portion of the model from the wing position to the tail picks up more moisture than the nose. That's why on a damp day the conventional model is always stalling. Here we can slide the wings back a little bit and correct for that without harm.

AT: What about the double nose block of yours?

FE: This facilitates winding and it's not as difficult as it may seem. One is left in, and the gears locked by dropping a pin through the loop at the rear and the motor stretched out and wound

fully. That's the motor with the prop attached; it is then put in place and the lower one is pulled out and wound. It's always advisable to check your gears before each flight to make certain they don't bunch, crab, or jump. A good way to stop jumping or crabbing in flight is to use a few more winds on the lower motor than on the top; that keeps the top one taut and power delivered to the prop all the time. If your top motor is wound more than the bottom one, it will wind out ahead of the lower one, and then it jumps and you can see actual power surges in flight. Very bad.

AT: How much do your gears weigh?

FE: One half ounce; they're made with ball bearings, have brass gears, and an aluminum facing mounted on a plywood plug with bushings. The rubber-covered hooks are similar to those the Finn used in his model. His gears, incidentally, were very good.

AT: How much loss do you think you have in those gears?

FE: We couldn't notice any loss at all; we flew the model on the top motor and then we flew it with the gears running, and we couldn't detect anything but an increased power run and greater duration. The climb was constant all through the whole flight.

AT: Speaking generally about the Wakefield, do you think interest is growing or is it just another one of those "old men's" events with "has-been" model builders looking for a trip?

FE: I believe that interest is on the upswing; this is indicated by the large number of contestants going in for it; many are quite young. They're not the old fellows who built models 20 years ago and just know how to build rubber-powered models and nothing else. There are a lot of Half-A model builders who think of the Wakefield as something they would like to win.

AT: Do you think the Academy should promote just one outdoor rubber event and make that the Wakefield contest exclusively, instead of fussing around with stick models and cabin models of various sizes? Do you think we should just concentrate on the Wakefield with everyone building the same ship or do you think that's too much of a limitation?

FE: If the AMA is to run but one contest for rubber, if they want to cut down the events, if they can't see their way clear to run a number of events, then by all means that event should be to Wakefield specifications so that we could get good models developed. I feel personally that we shouldn't eliminate any events because that way we're eliminating some of the fellows who like to build certain types of models. But if we are to cut down on any events, let's not cut them down in such manner that we will be left out of the international contests.

AT: How do American modelers stack up against overseas flyers?

FE: The American model builder is a better model builder because he doesn't concentrate on just one type of model. He builds practically every type he can afford. The English model builder, for instance, can't obtain engines and supplies as easily or as cheaply as we can. Their costs are so much higher than when they build a model they concentrate on it and really do a good job with the material on hand. If we were to run a contest which would include all our events and have a team from each country represented, I'm sure that we could show them how model building is done.

But if we ran a contest just for rubber, for instance, in which the British and the Continental flyers excel, we would stand a big chance of being shown how. But if you took indoors, outdoors, rubber and gas, stunt and speed, and put them all together and had the boys fly it out, I am sure we would come out 'way ahead of any foreign competition.

Crowbar "56"

(*Continued from page* 39)

When cabin sides are finished and the glue is good and dry, place one on each of the fuselage sides you have cut out—remember, you will have a right and left side, do not make two of the same. The cabin side uprights are glued against the inside of the fuselage sides so that the bottom end of each upright is flush with the bottom edge of the fuselage side.

You are ready now to join the sides together; cut the cabin cross braces the proper length. Set sides upright on a good flat surface and glue in the cross braces. Use a square to make sure sides are not "whamper-jawed." Also, the square is used to make sure one side is not shifted fore or aft. You should have discovered by now that the cross braces at the front and rear upright are the only ones you have that go against the insides of the upright, and the two at the center go against the inside of the fuselage and just in front of the center cabin upright.

After the cabin structure is dry, bend in sides at front to meet the firewall you have made while the glue has been drying on that "timber" in the cabin. Glue firewall in so that sides of fuselage overlap the firewall to make front edge of sides flush with front of firewall. With fuselage still down on that flat surface, bend in rear of fuselage sides and glue in the 1/8" sheet former located just in front of the stabilizer leading edge. Cut the cross braces in rear of fuselage to proper length and glue in. Bend rear tips of fuselage sides together and glue.

While fuselage dries, cut out from 3/16" plywood the former to which the gear is bolted. Bend landing gear and bolt in place on this former. Turn fuselage over, glue landing gear former in place with plenty of glue. Add the 3/32" balsa doublers inside the fuselage at front. Glue a piece of 3/32" over the top of nose from first cabin upright out over the firewall, and trim flush with sides and front of firewall when dry. Cut out bottom windshield holder, glue on top of nose.

It is a good time right now to glue in the 1/16" wire hook that holds the dummy in place. Glue in doubler inside nose at top and add another coat of glue all over inside of nose and around gear former. Now, fit a piece of 1/4" sheet in top of cabin at front for the top of the windshield to fit around and cut to shape, then place in dowel for holding in wing. Cut a piece of 3/32" sheet for window frame and use a different window shape if desired—I'm lazy, my windows are square. Plank top of fuselage from cabin back, place in the 3/32" plywood platform for stab. The bottom planking has not been added yet; before you install it go inside fuselage and give it a good coat of glue, including all joints inside fuselage, and then put the bottom planking in place. Build up the rear of cabin with the triangle pieces as shown. When everything is thoroughly dry, sand the fuselage and

The Best in Models!

SPEED? Stunt? Scale? Free Flight Gas? Big jobs? Half-A's? Rubber-powered craft? Brother, we've got 'em all in the brand-new, big 98-page Air Trails Model Annual for 1951. This is the famous model annual that has been issued in '43, '44 and '46 and each time has been a sellout! Here's a great big hint to every modeler who enjoys fine reading, who likes to build better models, who recognizes the value of expert guidance—get your copy while they're hot. You can get the new Annual, the "AT" Annual for 1951, at the same newsstand where you buy Air Trails each month. Print order was limited; after the newsstand copies go there'll be no more available of this issue. The price is a low 35c for the biggest bargain in air-modeling. Canadian readers cough up 40c; but they'll agree the material, the plans, the articles, the charts, graphs, drawings and photographs are easily worth 10 times that sum! This is the last call to dinner—don't miss this dish! Ask for "Air Trails Model Annual."

Here are but a few of the many fine features of the AT Model Annual for 1951. These annuals quickly become a collector's item so hustle down to the newsstand Get Yours Today!

give it a coat of clear dope. A piece of linen glued around firewall and back along sides of fuselage about an inch and one half will strengthen front end. Cut windows in windshield from a sheet of celluloid and glue in place, and the fuselage is complete except for covering.

Cut out the wing ribs so that they are all exact and alike. Ribs "B" are made of ⅛" sheet and the rest are 1/16" sheet. It will pay to spend a little extra time in cutting the ribs and notching them; I suggest you stack the rib blanks up and use a band saw or jig saw to cut as many as possible at a time. If you don't have such equipment, cut them with a knife or razor blade, then pin them all together and sand with a sanding block so they're all alike and all notches match.

"B" can be removed from the stack of ribs and notches cut wider to allow for the wing spar gussets, and the leading edge can be trimmed down to allow for the leading edge gussets. The trailing of the wing is made up of two pieces of 1/16" sheet balsa. Cut the bottom trailing out of a sheet of 1/16" medium hard balsa. Pin leading edge down to the wing plans and pin trailing with wedges under the front of it so as to allow for the contour of the bottom of the rib. Place in all "A" ribs and then top spar.

When dry, remove from worktable and place in proper dihedral. All the spar and leading edge gussets should now be put in place and the three "B" ribs added. When this much of the wing is completely dry, place in the bottom spar, top piece of trailing edge, leading edge planking and top cap strips. Cut the wing tips from a piece of ⅛" sheet balsa and soak in water to permit bending to fit the contour of the end of the wing. Glue on wing tip and put in center section planking, then sand wing thoroughly and coat with clear dope.

Cut out all the stabilizer ribs using the same system as in the wing. This means cutting out 18 ribs *except for the notches*—notch later. Now when the rib is to be cut down such as for "F", measure the length of the chord on the plans and cut off rear end of rib so that it's the correct length. With a razor blade and a straight edge cut from bottom of leading edge of rib to top corner of where rib was cut off at rear end. Do this for each rib and cut notches for spars and trailing edge when installing ribs. Lay down leading and trailing edges as you did in the wing, lay down bottom spars and glue ribs in place. Before lifting from board, the top spars and top trailing can be installed. When dry lift from board and glue on tips, shape the leading edge, glue in center section planking and give stab a good sanding.

Cut rudder and sub-rudder out of ⅛" sheet. Sand them so they have a streamlined section. Cut the bottom of the rudder so it will fit the curve on the top of the stabilizer. I suggest you wait and glue the rudder on after the stab and rudder are both covered.

Sky Sail or Jap tissue is fine for covering. Cover with anything you like as long as you do a good job of it. Silk on the fuselage is excellent if you have any. Use enough dope to get a slick finish and then apply a good fuel proofer.

Set the dummy in your ship at the position shown on the plans and check balance of plane complete. The best results have been with the C. G. at a point 6 inches back of the leading edge. If it is necessary to slide your dummy, install some braces so he will not move in flight. Give the ship a test glide before attempting a power flight. My plane and all the others like it here in Okie City glide to the left and climb to the right, and that is what I recommend.

After gliding by hand until a nice glide is obtained with slight left turn, give the ship a power flight with the engine running slowly and set at about a 10-second motor run. Do not attempt to go to full power all at once, but gradually increase power with each flight. You will probably need about two degrees down and two degrees right thrust to maintain a good climbing attitude to the right. All model builders have their own ideas about adjusting models, so if you have some other system you are sold on stick with it. I do, however, suggest you do not use high-pitch propellers. My best results have been obtained with 9/4 and 10/3 and 10/3½.

The Crowbar can be fitted with a pop-up tail dethermalizer or a parachute, whichever you prefer.

The Crowbar's dummy is constructed to minimize additional damage to the model in event of a crash landing. The eight-ounce weight, thrown about within the fuselage, could otherwise wreck the model. The dummy's sides and back are built of thick sheet balsa; his head is a one-inch cube. Several strips of solder are cemented to the inside back sheet after which a soft ⅛" sheet is cemented to the front. Should the model crash, the solder is torn loose from the back sheet, pushed through the soft front sheet, after which its inertia is reduced to the point where further damage to the model is unlikely.

Job: Instructor

(Continued from page 29)

the warmth of the hangar, Bill demonstrates with a model exactly what makes an airplane fly, explains why flying speed must be maintained from take-off to touchdown. Usually the student, tense of muscle and nerve when first they sit down together, gradually relaxes. Not until then is Bill ready to start that first, all-important dual exercise. Once in the air, Bill speaks in a confidence-inspiring monotone, emphasizing only the important points. "The guy will be no good if I yap at him constantly," he says.

Bill knows he will have this student for 35, and perhaps 40 hours in the air. Meantime, the candidate will expose himself to 50 hours of ground school, which will give him added familiarity with his airplane. And Bill doesn't intend to set up any psychological barriers by asking him to perform maneuvers until they have been repeatedly demonstrated. CAA removed perhaps the toughest barrier of all when the authority declared no more spins are required for either the private or commercial pilot's rating. To many, spins present what Bill considers an awful—repeat awful—hazard. Now he stresses both recognition of the stall conditions and stall recovery. Most spins, he knows, occur in the traffic pattern, when making a down wind turn or coming in nose-high. And that's usually too late for a recovery, anyway.

One big barrier remains: that first solo flight. It need not be so bad to contemplate, though, if all instructors should adopt Bill's procedure. As a rule of thumb, a student soloes at a certain number of hours. Bill thinks that the wrong approach. He'd rather leave the time for solo to the instructor's discretion, when the student becomes capable of taking over alone. As a pattern, Bill gives five hours of air work, three of shooting landings. Maybe his boy is ready at seven hours, perhaps not until nine or ten. The day Bill decides solo is indicated, he flies out to the training area as usual, comes in to shoot a landing. Casually, then, he steps out, says, "It's all yours," and walks away. Before he can boast, "Isoloedtoday," the student is up and away, like a bird. He hadn't spent a week of over-anxiety. He simply trims the airplane, shortly discovers it handles to his benefit without a passenger—and odds are heavy he touches down more gently than on any dual flight.

No man who flies, from the latest member of AT's Solo Club to a holder of the famous Caterpillar emblem, ever will forget his first trip at the controls alone. Sure, he's a flyer as soon as that epochal event ends. But he's scarcely a good pilot. He decides to continue for a commercial rating. That's where Bill comes in again.

More than ever, Bill realizes he is a teacher, not merely the other guy in the airplane. He considers future lessons a gradual process of learning. Comes now extended cross-country, both day and night—and with it a bit of good, sound psychology and salesmanship. Especially if the student begins to exhibit fear of the dark.

Elementary maneuvers, steep turns, chandelles, Lazy 8s. All fit into the advancing pattern. How do you make a Lazy 8? You don't start in the airplane. You begin by bending over a patch of clean earth, peering at Bill's right forefinger as he describes the pattern on the ground. With motions, he shows exactly what happens to the control in each position. "If you learn coordination well," he tells his student, "you should not have too much trouble."

Bill knows from experience that he must get over one point: to execute these maneuvers, his boy must fly subconsciously. He cannot, like the professor of mathematics, solve triangles continuously as he approaches an intersection to avoid an accident. His reflexes take over for conscious thought. Bill will do the thinking, and the correcting. Coordination will follow with time and experience.

Or Bill calls for a climbing turn. Coming out of the turn, they go into the maneuver again. Then he calls for a chandelle. The climbing turn becomes part of the chandelle. He goes from one to another, then puts the two together.

Shortly, his student chandelles with no thought of the climbing turn.

Bill thinks of his job in terms of progress, not problems. "A good instructor," he tells you, "avoids trouble." Nor does he expect his student to encounter too much difficulty. Bill checks him thoroughly on cross-country before he sets out on a night flight. He makes certain the student forms a sound judgment of the weather, that he knows the terrain, that he knows his position accurately, that he knows where to go should his engine stop.

This could be an exciting story were it concerned with a test pilot or a hot Air Force combat pilot. But it deals with the prosaic routine of up-and-down, day after day. To Bill, however, it's a rewarding routine, for he is building the nation's future crop of pilots. By the time his student hits 160 hours to complete his commercial course, Bill hopes he may exhibit some signs of becoming instructor material, himself. "Good instructors are badly needed," Bill assures you. How well his student deports himself during instruction and through the final flight check has much to do with his acceptance as an instructor.

Bill soft-pedals the mental hazards, tries to instill confidence. When one of his boys does go up for an instructor's rating, though, Bill can't act as CAA examiner. That job is reserved by CAA, for its own staff inspectors. No substitutions are permitted here.

Let's flash back a moment. . . .

When Bill came up for flight instructor's examination, he knew he would face tough oral and written exams. Having read Civil Air Regulations more than once, he understood he must have had not less than three hours' instruction on spinnable airplanes.

Which rating did he seek: airplane, glider, autogyro or helicopter? Was he shooting for a ticket on single or multi-engine, land or sea? Being more than the required 18 years old, he sailed into the searching examinations. Before he completed the rigid requirements, he flew straight and level, made moderately banked turns in both directions, demonstrated minimum glides, maximum climbs, approaches to stalled attitudes, stalled, skidded, slipped, spiralled, recovered from unusual positions. More, he demonstrated his skill at flying by radio, and let down using instrument approach.

Tough? Sure. But tougher yet was the oral examination, when the government man looked him in the eye, asking questions that determined whether Bill was another Dale Carnegie who could win friends and influence people —to become good pilots.

How many friends and how many people? The G.I. Bill soon will cease to send boys into the schools for flight training. But the defense program will bring 100,000 hours of training to hundreds at Greenville. More hundreds of thousands of hours at other bases. Most all these will be operated by present school organizations on contract. The CAA approved schools will receive more trainees, and a program is in the making for colleges and high school students. Bill enjoyed G.I. training, and from that climbed to instructor. Just how expert is he?

Bill signs off with this footnote: "The day a flight instructor stops learning more about airplanes and how to fly them, that day he'd better quit. A pocket full of ratings is no guarantee of success. As long as you stay ahead of an

airplane in your thinking, you'll never get into trouble. It's when you get behind it, in thinking or habit, that you are headed for disaster."

Bill's not the kind to lose interest. He is headed upward in an expanding career. Formal school training lies behind. Now it's up to him to stay on the ball.

Cutlass

(*Continued from page* 48)

Douglas, Curtiss-Wright, McDonnell and other companies responded with new designs. These bids were opened in April 1946 and in June 1946 the Vought XF7U-1 was selected and an experimental order for three airplanes was awarded Chance Vought Division, United Aircraft Corp.

It was not long afterward that word began leaking out that Vought's new Navy fighter was a tailless design and this brought a knowing wagging of heads to the competition. Engineers have known for 30 years that the fuselage and tail of an airplane comprises 60 percent of the total drag; its elimination reduces the airplane drag proportionately and the result is a much faster, farther and higher flying airplane. But they have also known that longitudinal stability and control—normally provided by the tail—must be built into the wing itself. That means symmetrical or reflexed airfoils with accompanying low maximum lift coefficients. This is handled only by more wing area than the conventional design requires and, therefore, a drag considerably higher than the simple theory would indicate.

But Vought engineers went after that theoretical low drag with a vengeance. The use of 35 degrees wing sweep presented even further complications because of its tendency to induce a spanwise flow towards the tips and create even further lift reductions. Vought attacked the problem by the use of very large leading edge slats in the area of the lateral controls so that good airflow would be preserved over these vital controls at low speeds, thus counteracting tip losses. Another way to handle the problem was to use "air dams" along the wing to interrupt this spanwise flow, and Vought engineers carried the fin leading edges well forward.

The problem of stability and control was compromised rather than solved. Pioneer all-wing designer John K. Northrop proved in the Flying Wing airplanes that an airplane can be built entirely without vertical surfaces of any kind, but Vought engineers could not risk the noticeable skidding on turns and low directional stability of the true tailless airplane. So large fins and rudders were used. The wing trailing edge surfaces, of course, are forced to do double duty in a tailless airplane; they must be elevators and ailerons simultaneously. Northrop called his controls "elevons," so Vought scrambled the two words again and came up with "ailevators." When the two controls move up and down together they are elevators; when they move differentially they are ailerons.

The original F7U design called only for two straight Westinghouse J34 turbojet engines, but the tests on the afterburner-equipped F6U Pirate pointed the way and F7U designers quickly added two huge Solar afterburners to the two J34-WE-22 engines on their design. It was this last-minute change that gives the F7U its odd afterfuselage shape but also provides the sleek swept interceptor with 10,000 lb. thrust for short bursts of speed, the most potent powerplant ever placed in a Navy fighter.

Quick take-off requires plenty of high-lift and high-power. The revised F7U had plenty of the latter but the thin, symmetrical high-speed airfoil was never designed for producing much lift. To overcome this, Vought engineers cocked their new fighter up at an angle of 9 deg. on the ground, which gives it its peculiar nose-high stance. This provides a high angle of attack to the wing while the airplane is rolling along level. In an actual take-off that nose moves up as high as 15 deg. before the airplane leaves the ground!

The Cutlass is a big airplane, weighing more than 10 tons. Yet this weight is easy to understand when you consider the 12G loads it must take, its pressurized cabin, its extra-strong landing gear for those carrier landings, its heavy armament and large size. The cabin air conditioning system provides heat for the pilot at moderate speeds at high altitudes and cooling for the pilot at high speeds at lower altitudes, because of the friction heating of the fuselage skin by the air racing past. A pressure differential of 2½ lb./sq. in. is available so that at 20,000 ft. the pilot is riding in the same atmosphere existing down at 12,000 ft.; at 30,000 ft. the cabin altitude is only 18,000 ft. and at 40,000 ft. the cabin altitude is about 25,000 ft.!

How fast is the Vought F7U Cutlass? With those big afterburners operating it has hit sonic speed repeatedly at low altitude, but the real test of an interceptor is how fast it is at high altitude. At a time when most jet fighters are attempting to keep above stalling speed at 50,000 ft., the big Cutlass is clicking off better than 400 knots. As for getting upstairs in a hurry, the swept-wing brute passes 40,000 ft. going like a rocket after only four minutes of climbing!

But neither Navy nor Vought engineers are yet satisfied and production plans for the airplane have been delayed twice by substantial changes. It's a hush-hush fact that the new F7U-2 is powered by two giant Westinghouse J40 engines producing more than 20,000 lbs. thrust with afterburning—twice the power of the current model. That means a supersonic Cutlass is on the way down the production lines and an entirely new era in carrier-borne fighter tactics is now aborning!

Hot Off Wire

(*Continued from page* 44)

are undertaken. Speed flying will never increase its popularity by any large amount; however, the powerplant field is still wide open for the pure speed addict. There will undoubtedly be hotter and smaller engines developed, but what about jet or rocket powerplants? The limited number marketed today augurs there is plenty of room for more. When this field is explored further, we can expect to see some real speed records and a whole new rule book to go with them.

Jet speed has kept pace with prop-driven speed and experimenters continue to search for the answer to take-off cut-outs and faster starting. Various tank baffle arrangements are working

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A new contest has been added in the

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New Clipper* Cargo Competition for the class ½A model plane carrying the greatest payload. Send for rules NOW—be ready to WIN Cash Prizes!

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*Trade Mark, Reg. U. S. Pat. Off.

PAA LOAD EVENT

Standard PAA Load Events for The Nationals and other contests this year will be in ½A and in a combined A & B classification.

There is a new smaller dummy for ½A: body 1½" wide by 2¼" high by ¾" thick, and surmounted by a head ¾" x ¾" x ¾"; weight 3 ounces. Dummy for A & B is the same as last year.

Mail coupon below for full information about ½A contest and the 1951 PAA Load Event.

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out. Some have discarded metal fuel tanks completely, using the hollowed wood fuselage nose instead. Halves are carved and coated inside with Weldwood before final joining. All metal ships with engine completely enclosed are flying well and solve the problem of backfire and subsequent bonfires.

The leveling off of interest and performance in speed and stunt has really stirred up some novel ideas for future events. Proposals such as the "one-ship contest" may sound fishy at first, but given a little thought it all doesn't sound too bad. Why not fly speed and stunt with one airplane? A wedding of the two would turn up a pretty interesting airplane. Here the designer really will have to pull out some fancy rabbits to keep up with the competition.

Go a step farther, make the speed contest a fast and slow affair, even add a payload test. The latter has already been tried out and results were pretty phenomenal. Model design and flying events have concentrated usually on one particular type of performance; free flight's aim is endurance, in stunt it's maneuverability, speed chases the stop watch. But only in free flight payload is there a definite combination of two types of performance. In other words, if we are going to make model flying more interesting, we'll have to give the models and flyers a greater challenge. Why not demand broader performance from one model? The Navy Carrier event requires this sort of thing to a limited degree, and there is no reason the ball can't be carried on from there.

More realistic flight performance keynotes the proposed rules for Flying Scale events in 1951. Instead of the stunt pattern being a part of requirements, prototype flying will probably take its place. This means that the model can simulate the actual flight of the full-scale airplane. The four-engine boys can stick to straight and level, but will get more points for dropping bombs or retracting gear. The Pitts biplanes will get more points if the model can do a few flip-flops. This puts the varied types on a more equal basis and should help solve the difference felt in past years.

Fidelity and workmanship scoring will remain about the same. All this means that, to win, the modeler will have to have a beautiful model that not only flies straight and level but can do some other tricks to imitate its full-size cousin. Other proposals include limiting engine run so that flying at contests can be run off more quickly. This might mean cut-offs like those used in team racing.

Speaking of team racing, the new baby is doing fine. As soon as more flyers can start their engine at the drop of a prop nut, this event will really gather the followers. The initial difficulties and discontent experienced by some breaking into this phase of flying are guaranteed to dissolve once a modeler gets the first few races under his belt. It's just like eating oysters—you never know till you try one. Some broad local interpretations of the rules have been made; rather than a one-ounce tank, a large capacity is used to get all the laps possible. This then becomes an endurance race, and although this type of thing is not eligible for A.M.A. contests it takes a lot of the boil and bubble out of the event when a small fun show is on the agenda. More efficient engine cut-offs are being worked out and at the bigger contests smooth races resulted. A good cut-off is worth all the trouble it may entail. Let's not neglect the two-speed engine for team racing. This would lick the hot re-starting troubles.

Intake plugging in the interest of fuel thrift is becoming standard procedure. Medium-pitch props for short dashes and higher pitches for long races are fertile ground for experimental work. Fuel economy tests with different fuels will give some of the hot answers to those who haven't gone to the trouble yet. The coming months should see more interest in this very worthwhile event. Try it once and you'll buy it.

Another variation on the team race theme turned up with the small bore (Half-A) engines. Very successful races have been flown on 20-30 ft. lines and speeds have ranged from 40 to 70 mph. This could really develop into something as the popularity of the little engines cannot be denied.

The Navy Carrier event was run for the first time at the 1950 Dallas Nats. Although the number of entries was small, it turned out to be an interesting affair. Like any new event some attempts met with trouble. The problems of slow flight and spot landings are considerably different from speed or stunt. This type of flying is new to the spin-dizzies and demands much more performance from a control-line model. At the Plymouth Internationals an exhibition Carrier Event was held and a very successful show resulted. The ships used ignition with two-speed timers, which proves to be the immediate answer to fast and slow-speed flight. Since point scoring is based on the speed difference, the biggest gap possible will help win future contests. Here's plenty for the gadgeteers to play with. Flaps, spoilers, trailing parachutes, variable-pitch props and engine throttles will be the toys that do the tricks.

The yo-yo artists are not the least bit adverse to a little rough and tumble now and then. Although combat will probably never be written into the A.M.A. rules, ribbon cutting has become a pretty popular pastime. As an exhibition event it can't be beat. Some flyers seem to think the idea is to cross-dive the other guy. Now, look here, fellers—the ribbon, the ribbon—just cut the ribbon. Plane landing with longest ribbon wins. How about an unwritten law for combat flying: "Collision disqualifies"?

One final prediction before we close up shop. The small-bore-powered completely collapsible model will become very popular during 1951. Fits nicely into barracks bags, foot lockers and sea bags. Once a model builder, always a model builder.

Spitzy

(Continued from page 52)

gripping prop and turning over slowly with batteries connected to glow plug and fuel in the cylinder. A slight kick will be felt after the exhaust ports close, long before the piston reaches its top-most position.

The condition was overcome by changing to a colder glow plug, such as a Champion or Arden, for the inital engine run. After ten minutes the piston limbered up sufficiently to make starting easy with the Spitfire plug supplied. From this point on, performance is much better with the high-compression ratio and hot plug, so it would be a mistake to alter the engine in any way to compensate for initial hard starting. A loose fit would be undesirable since it would reduce total engine life, and lower compression would cause unsteady running in flight.

After one hour of running on the Spitfire plug the engine would continue to run on a lean needle valve setting and was limber enough to start rpm tests, indicated in the performance figures. Engine performance was very steady at all speeds and easy starting resulted with one drop of fuel as a prime in the exhaust and no fuel in the carburetor. Adding as little as one drop in the carburetor flooded the engine, making it necessary to flip twenty to thirty times to work out the flood. Testing on various fuels shows an increase of approximately 1,000 rpm when changing from stock fuels to those blended for Half-A engines. Also starting was more rapid, performance steadier.

ENGINE DATA

Performance. Weight with tank: 1.42 oz. Propeller—6/3 Spitfire prop in kit: 10,000 rpm; 5¼/4 narrow blade wood: 11,200 rpm; 5½/4 plastic: 11,500 rpm; 5/3 narrow blade wood: 13,500 rpm. Fuel: best results on Half-A blends. Fuel level test: 6½″ at 11,000 rpm. Engine run on built-in-tank: 1 min. 20 sec. at 10,000 rpm.

Design Data. Displacement: .045 cu. in. Class: Half-A. Stroke: .405. Bore: .379 in. Stroke bore ratio: 1.07. Compression ratio head: 6.5. Compression ratio base: 1.39. Port area—intake: .0101 sq. in.; bypass: .0119 sq. in.; exhaust: .0270 sq. in. Ignition: Spitfire glow plug.

Construction Features. Bearings—crankshaft: aluminum; crankpin: steel; connecting rod: steel. Tank cast integral with base. Wrist pin ball joint held with steel snap ring. Three port intake and exhaust.

PARTS ILLUSTRATED

1. Base & fuel tank, aluminum, .50 oz. Needle valve body, brass. 2. Base gasket, asbestos, .010 thick, .00 oz. 3. Bypass sleeve, aluminum, .502″ I.D. x .290″, .04 oz. 4. Back cover plate, aluminum, .632″ dia., .04 oz. 5. Cylinder head, aluminum, .05 oz. 6. Cylinder, steel, .3785″ bore x .992″ long., .26 oz. 7. Needle valve, steel, .052″ dia., .02 oz. 8. Crankshaft, steel hardened & ground, .218″ dia., .107 crankpin, .20 oz. Drive washer, aluminum, .550″ dia., .03 oz. Propeller washer, aluminum, .565″ dia., .02 oz. Propeller nut, brass, 5-40″ N.C., .02 oz. 9. Glow plug, steel, ¼-32″ thread, .12 oz. 10. Glow plug gasket, copper, .029″ thick, .01 oz. 11. Piston, steel, .3785″ dia. x .315″; connecting rod, steel 7/8″ long, .11 oz. Total weight with tank, 1.42 oz.

Parade

(Continued from page 12)

Storm Swept. Hurricanes and floods which swept the Eastern seaboard the latter part of 1950 wrought havoc in private aviation. At the Piper Aircraft factory in Lock Haven, Pa., 137 airplanes at the airport and in final assembly stages were ruined by the onrushing water and had to be scrapped. Fifteen ferry pilots who arrived at Lock Haven from all parts of the country to take delivery of airplanes were stranded until a new production line was set up. The first ships off the line were scheduled for them.

Flying Scaffold. Monsanto Chemical Corp. of Everett, Mass., has solved the ticklish problem of how to paint a 150-ft. stack with a minimum interruption in plant operation. A helicopter was pressed into service. Steeplejack George Burgess was flown to the top of the stack, where he leaned out the craft's door and dropped the staging hook and played out block and falls into correct position. With the helicopter landed, the steeplejack hurried to the base of the stack, got into the bos'n's chair attached to the rigging and went to work. Monsanto Chemical Corp. saved a day and a half of time ordinarily required to erect scaffolding.

Suspend Production. Increased defense work forced suspension of production of the Swift and Silvaire airplanes by the Texas Engineering & Manufacturing Co., of Dallas, Texas. There are still a limited number of these planes available at the factory which will be offered, while they last, at 1950 prices.

Wanna Jenny? An analysis of planes registered in Missouri has divulged that there are six vintage machines in the state of over 20 years of age. The grandma of them all is a Curtiss JN4D, Jenny of World War I fame, restored to flying status by St. Louis Flying Service.

Beware of the Atom Plants. The CAA has issued a reminder to private pilots to keep out of Atomic Energy Prohibited Areas, clearly marked on aeronautical charts. There have been numerous violations of the order recently, mostly due to poor navigation on the part of the pilots. Besides leading to the unpleasantness of being followed by fighter aircraft guarding the area, the offense carries stiff fines and imprisonment.

CAP in Future War. According to informed Washington circles, Civil Air Patrol's mission in the event of emergency has been defined. One of the most important phases will be the development of an auxiliary radio communications net using mobile equipment and capable of operating if power fails.

A number of support units are planned whose teams will include transportation, communications and radiological defense specialists as well as pilots and mechanics for emergency air missions. These units can be sent out at minutes' notice to critical areas. They will evacuate the wounded, patrol roads, transport medical supplies and food, control traffic.

Other CAP functions will be anti-submarine patrol, search and rescue missions as auxiliary to Air Rescue Service and the Military Air Transport Service, as well as the continuation of CAP cadet enlistment and training.

Navy Fighter

(Continued from page 23)

curves (and parallel curves between them) have the same top speed at sea level. Here we want to get low and to the right, and it's clear that the Air Force fighters lie generally lower and to the right of the Navy planes. That means that for chasing a retreating bomber near sea level, the Air Force jet fighter is superior.

In the interception game, however, what the pilot really deals in is time, not speed. For example, when enemy bombers are reported at 45,000 ft. 75 miles out, the object of the defense is to knock them down in the shortest possible *time*. The best interceptor, then, is not the fastest, but the one that has the quickest take-off, the fastest climb, the shortest turn into firing position (coordinated with target detection and identification) and the most accurate pass with the heaviest armament. Let's take just a moment to compare the carrier-based fighter with the land-based model in a step-by-step analysis of this procedure.

We have already seen how the Navy fighter gets airborne much more quickly than the Air Force fighter. In the matter of getting upstairs quickly, rate-of-climb varies inversely as the wing and power loading. The lower these two factors, the higher the rate-of-climb, and our chart shows the clear superiority of the Navy airplane in this department. The lines sloping downward and sweeping toward the right are lines of equal rate-of-climb. Notice the sharp dividing line around 4,500 ft. per min., the Navy planes lying generally below this line in the region of higher rate-of-climb, the Air Force fighters scattered above this line toward lower rate-of-climb.

This means the Navy fighter will reach the bomber's altitude an interval of several minutes before its faster but more heavily-laden Air Force brother. This same relationship holds true for attaining really high altitude, for ceiling is determined by that same combination of low wing and power loading. That in turn means that if the enemy bomber is cruising at 50-60,000 ft., the Navy plane will make the grade while the Air Force plane will not, its dramatic sea level top speed being left far, far below.

Again, maneuverability at high altitude is also enhanced by low wing and power loading, and our chart shows graphically how quickly the Navy fighter turns and maneuvers above 40,000 ft. as compared to the heavier Air Force fighter, whose low lift at this height makes wide, gentle turns a necessity to avoid stalling out. It is above 40,000 ft. that the Navy fighter really comes into its own and is a master of anything that is able to poke its nose up above this rarified domain.

And just to complete the picture, all Navy jet fighters mount four 20-mm cannon in their nose, compared to the 4-6 0.50 caliber machine guns standardized on Air Force jet fighters. This not only means longer effective range (about twice as far) but the cannon shell explodes on contact in a terrific destructive charge, while the 0.50-caliber machine gun fires only a slug.

Thus, the Navy carrier-based jet fighter gets off quicker, climbs faster, maneuvers better and hits harder than its Air Force land-based brother, which about wraps up the case for the Navy fighter as our best defensive weapon

against enemy bomber attacks. But the story wouldn't be complete without dismissing once and for all the old "sitting duck" myth of the aircraft carrier. It's so easy to become an anti-carrier man. All you have to do is visualize a big, broad, flat-topped ship sitting in the water a few thousand feet below your mental bomber, just ripe for plucking. A single heavy bomb square in the middle of that flight deck (and how could you miss?) and that multi-million dollar monstrosity is on its way to the bottom! In a flash it's all over—not only your dream carrier below but the whole complicated argument of the aircraft carrier as a war weapon of the future. Yes, it is so simple to become an energetic anti-carrier man that the whole process takes only about as much time as it does to read the words in this paragraph.

For instance, the argument that the aircraft carrier—as a surface vessel—is a poor combat weapon: its 12/14 5-in. guns are little more than a destroyer's armament, it has no torpedo tubes and carries no depth charges. It is no more an offensive weapon than Idlewild Airport or your own local landing field, for that is all an aircraft carrier is: a sea-going airport. But right here is where the idea of the carrier's so-called vulnerability comes a cropper. Without a single exception, *every* combat airfield and strip used by the Nazis and the Japs during World War II was destroyed or captured; that's 100 percent vulnerability. From Pearl Harbor to V-J Day, the United States lost exactly eleven carriers (five carriers and six escort carriers) out of the total of about 150 placed in service. That figures out to less than 7½ percent losses—the kind of percentage all branches of the service would very much like to have for all their weapons.

The instrument the Navy fights its battles with is the airplane—not the carrier. It is the airplane the Navy throws at the enemy and the carrier makes it possible to do that 5,000 miles from the plane's home base, not the 350 miles of the land-based fighter. The range of the Navy jet fighter is built into the carrier—not the airplane. USAF Lockheed F-80 Shooting Star jet fighters were forced to operate for many, many weeks from bases in Japan, with the result that their time over the target in Korea was something less than 15 minutes. Grumman F9F Panther jet fighters operating from carriers offshore were able to spend an hour or more at the target simply because the range required for the trip from Japan to the 38th Parallel was contained in the water-borne carrier and not the airplane.

All these facts point to the Navy carrier-based jet fighter as our Number One defense against Russia's atom-bombers, not only directly over our great cities but anywhere in the world they may fly. Our Early Warning radar net may give us detection coverage over a distance of 3-400 miles, but our carrier-based fighters can be counted on to give us not only detection but protection, not only 400 miles but 8,000 miles from our shores.

PHOTO CREDIT LIST

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Air Adventurers

(*Continued from page 35*)

sample tests and a short, easy, interesting course of instruction to start you off on your aviation work.

We might say at this point that a very detailed program has been worked out for the Air Adventurers, but portions of it are still being checked in Washington and we do not want to be premature in any announcements. So the best advice is, send in your membership application right away so you will not miss out in any of the preliminary work and fun. And don't be misled—there'll be a lot of enjoyment in working along with your fellow members and headquarters.

We've already instituted studies on how AA'ers can best work into the air spotting movement (1,500,000 volunteers are needed!), assist in the Solo Club activities, participate in the important undertakings of the Civil Air Patrol, and get up-to-the-minute info on training for aviation careers.

Your immediate assignment while waiting for your credentials is to complete and test-fly the two Air Adventurers training gliders presented in this issue. Then save them carefully! Even if you're an advanced model builder you should do this since you'll be using both of these models to train new Apprentice Class Airmen later on. When you receive your membership card you'll get additional instructions on how these trainers will be utilized.

The distinguished AA pin, incidentally, is available for an additional 25¢—membership alone is 25¢, membership plus the pin is 50¢. *You do not have to have the pin to be active in the club.* But it's a very nice-looking lapel emblem and one you'll be proud to wear, so by all means include the extra 25¢ *with your membership application* if you want it. It's about 15/16 inches wide, is gold plated and has the letters "AA" in blue enamel. You'll find it somewhat more graceful than the emblem drawing on page 34 since that was an earlier design study for the club insignia. The official pin has a safety pin-type clasp back so men can wear it on the lapel of their coats and the gals on a sweater or dress.

Are girls eligible for membership, you ask? Absolutely. Women are playing an increasingly important part in aviation as a reading of "The Woman's Angle" on page 10 of this issue will indicate. America needs more women in aviation and the Air Adventurers welcome the ladies to membership.

That about winds up the report for this issue. But before we sign off we want to let you know that headquarters will welcome your comments, photos of you and your airplane or model, suggestions for club activities—in fact, anything and everything that will help make America first in the air. Ere we give you "over and out" signal, however, we want to urge you to get underway with Air Adventurers Training Gliders #1 and #2 *and* send that membership coupon in today—right now.

—ALBERT J. CARLSON

THE AIR ADVENTURER GLIDERS

The science of aviation is best learned by undertaking a study of the simplest types of models first, then progressing to more complex designs, including powered models, then on to a study of full-size aircraft. If a series of models is tackled in this manner, the beginner will gain an understanding of the modelplane field that will enable him to undertake the construction of practically any type of modelplane with confidence and a sure chance of success. Furthermore, should he desire to do so, the student of model aviation can go on to a career in full-size aviation work with a big headstart over those who have never enjoyed such advantage.

We stressed "simplest types," for no science can be understood properly if one tackles a more complex phase first, skipping over elementary steps that are so easy, but so necessary.

In model aviation, the glider is the simplest type of plane; from it can be learned most of the facts of aerodynamics, without the added complication of a mechanical source of propulsion.

A series of models of graduated complexity will be presented for Air Adventurers starting with this issue. Our efforts this month will be devoted to building two types of gliders, and next issue we shall take up a simple rubber-propelled design.

A Cardboard Glider. It is possible to construct a very successful glider using nothing but cardboard for the building material. For the glider shown here, we chose an ordinary lightweight manilla filing folder, available in every stationery store. As this is a rather flimsy material for too large a glider, the wingspan has been kept to moderate size; in fact two gliders can be made from each folder. The first step is to trace a full-size outline of one half the glider on your cardboard.

It is best to draw a centerline on the cardboard, then lay out one half the glider from this centerline outward. Next, cut the half-glider to shape. Now, score along the centerline, fold the cut-out portion over and trace around it on the uncut side. In this way you can be sure both halves are alike.

The cardboard should be scored at all points where it is to be folded and this can be done with the rounded end of a paper clip, using a ruler for a guide. Do not cut the cardboard at these points, however, and note that the scoring should be done on the inside of any fold. The centerline and rudder scores are made on one side of the sheet, wing and stabilizer scores on the reverse side.

Fold the cardboard at the various score marks you have made, and your glider at last will begin to look like a real plane. Assembly is started by spreading cement on the inside of the fuselage, then squeezing the two sides together; it will probably be necessary to hold them together for a few moments until the cement sets. After about 15 minutes, the wings, stabilizer and rudder may be bent to their correct positions.

A brace is needed to strengthen the wings. This is just a ½" wide strip of cardboard about 5½" long. Fold it at the center, then insert each end in the slits which are marked on each wing. The wingtips must both be raised one inch above the wing center; this forms what is called dihedral angle, or simply dihedral, and it imparts a degree of stability to the glider that would be entirely lacking if the wings were to be made with zero dihedral—that is, flat across the top from tip to tip. When the wings have been set properly, add a drop of cement where the brace passes beneath the fuselage. Clip the excess brace 1/16" above each wing panel, and put on a *tiny* drop of cement at each point (excess cement here will deform

the wing). A line of cement on each half of the stabilizer—both above and below—where it joins the fuselage will strengthen this joint.

Your glider is now almost ready to go; all that remains is the matter of balance. Considerable weight must be added to the fuselage nose; two paper clips were just right on the test gliders.

Before we try a flight, what about "decorations"? To be sure, your glider will fly just as well with or without, but certainly insignias, numerals, et cetera, add a lot of interest to any model. Such decorations are easiest to put on this glider before the folding is started, or even before you cut the cardboard to shape. India ink is best for cockpit outlines and control surface markings. Wing license markings can be clipped from calendars and glued on, or decals may be used. Most hardware and art stores carry decal numerals and letters in sizes from ½" up. Whatever method you use, spend a few minutes on decorations—it's worth it.

The glider is launched by grasping it just back of the wing brace and throwing it forward at a slight downward angle. The idea is to launch the model at the same speed with which it flies. This takes practice, but keep at it until you get it right.

After you have mastered the launching technique, you can experiment with adjustments. If the glider dives abruptly downward, try bending the rear edge of the stabilizer up. If it stalls—that is, swoops upward—then drops its nose to dive down and climb abruptly, again and again—bend the stabilizer rear edge down. Turns can be accomplished either by bending the rudder rear edges sidewise, or by bending the rear edges of the wingtips up or down. You can test the effect of launching the glider in a bank, with the wing inclined sideways from a level position.

Check all possible combinations of control movements, learn just what each will do, and you will have made a big start in your study of aerodynamics.

Building time: about one-half hour (not counting the decorations).

Materials required: one manila folder, approximately 11¾" x 9", (enough for two gliders); cement; two paper clips; decoration materials as desired.

Tools needed: pair of scissors, ruler.

An All-Balsa Glider. The second model in our series is to be another glider, but this time a rugged balsawood job that you can really heave up into the air for long flights.

All the necessary wood for this one comes from a single sheet of balsa, 36" x 3" x 1/16", and if you work carefully, you'll have quite a piece of wood left over for future work. Note that a layout and cutting plan are given. Mark

the pieces out on your balsa with a soft pencil, then cut them out, using a razor blade and a ruler as guide. Use only the single-edge style of razor blade —it has a heavy backbone and is much less likely to cut you than the double-edge variety.

When marking the pieces and cutting them out, do not worry if some parts are out a sixteenth of an inch here or there. There are no critical dimensions. Some 3" wide balsa sheets have been found both 1/16" too wide, or the same amount too narrow; if your strip is narrow, simply make the wing chord (or width—3" on this model) and the fuselage height a bit less. Try to retain the 3/16" difference between the 1½" and 1-5/16" height marks on the fuselage, however; this 3/16" difference determines the wing incidence angle (the angle between the wing chord and any arbitrary fuselage reference line—in our case, the fuselage bottom is the reference line) which affects the wing lift considerably.

The two fuselage sides are cemented together to form a single piece ⅛" wide. Rub cement all over one piece with a fingertip (work *fast* as the cement dries rapidly), then place the pieces together and squeeze out any excess glue. The long, straight 9¼" section is the *bottom* of the fuselage.

Allow the fuselage to lie on its side on a flat surface for 15 minutes. Meanwhile, you can assemble the wing; round off all edges and the tips of the wing halves. Put a layer of cement on one inner panel end. Then join the other half to it and lay the joint on a sheet of wax paper so the cement won't stick to your table. Raise each wingtip one inch from the table surface with a small block. This gives a total dihedral of 2". Smear cement on the joint and spread it out for ½" each side—you don't want the wings to fold up on a husky launch, do you?!

Cement the rudder to the fuselage side, and the stabilizer to the fuselage bottom surface, taking care that they are both "square" with each other and with the fuselage.

The wing joint should be well set by now. Remove the wax paper and put a heavy coat of cement on the underside of the center joint; add another layer to the upper surface, and set the wing on edge to dry.

The last assembly job is to join wing and fuselage. The wing is attached 3¼" from the fuselage nose—use plenty of cement and hold the wing in place with a couple of pins while the cement sets. In 15 minutes or so, add another layer of cement to the fuselage-wing joint.

Balance weight will be required on the nose, but the amount will depend on the grade of wood you have used—balsa varies greatly in weight. One test model was balanced with 13" of rosin-core wire solder, while two pennies cemented in place balanced another. Experienced glider builders use modeling clay for this purpose.

Any decorations you wish to apply should go on now. The first step is to sand all balsa surfaces of your glider with #3-O sandpaper or finer. Always sand *with* the grain, never across. Then apply a coat of clear model dope thinned half and half with dope thinner. The dope raises the balsa grain a bit and you should give the plane another sanding after the dope has dried for 20 minutes or so.

Decal numerals and letters work nicely on balsa surfaces. A form of decal called Trim-Film is available in hobby stores; it comes in sheets and in many colors. This sheet was used to decorate the glider pictured. The Trim-Film was cut with a sharp razor blade and applied as per directions on the package. When it had dried, a coat of half-and-half dope was applied to the Film only. This material wrinkles up shortly after the dope is applied, but smooths out again as it dries—don't try to smooth out the wrinkles yourself. Finally, a second coat of half-and-half dope was applied to the entire glider.

With the experience gained on your cardboard glider, adjusting this one should be easy. Adjust for balance with small weights fore and aft, until you get as long a glide as possible, but with no dips. The balsa surfaces can be bent slightly for adjustments by holding the wood before your mouth and breathing on it a few moments. The moisture in your breath softens the balsa so that it will retain the bend.

For really good performance, the model should be adjusted for a left circle (if you are right-handed), then launched in a moderate right bank and at a sharp upward angle. To hoist 'er up there requires a real heave—practice this and you'll obtain some fine duration flights.

Building time: Approximately one and one-half hours (decorations not included).

Materials required: one sheet medium weight balsawood 36" x 3" x 1/16"; one 10¢ tube model cement—fast-drying grade preferred; one 1 oz. bottle clear dope; one 2 oz. bottle dope thinner (some will be needed to clean dope brush); several plain pins; six-inch square of wax paper; balancing material (wire solder, or modeling clay); Trim-Film for decoration (one package enough for half a dozen gliders).

Tools required: one single-edge razor blade (or a modeling knife); one 12" ruler with metal edge; one camel's hair brush for applying dope; three-inch square of #3-O (or finer) sandpaper.

Round-up

(*Continued from page* 58)

day. Air was dead most of the time, but when the thermals came out they were wonderful. The results of the contest more than justified the trial, so they intend having a two-day affair at their Annual next April. The results of their Semi-Annual are as follows:

Towline Glider 1st, Kenneth Durant, Bakersfield, 13:37.3; 2nd, Dick Everett, San Diego, 4:54; 3rd, Hal Harenbergh, Bakersfield, 4:45. Stick Rubber 1st, Andy Peterson, Burbank, 24:05.1; 2nd, Jack Block, Los Angeles, 14:29; 3rd, Dick Everett, San Diego, 13:09.7. Cabin Rubber 1st, Dick Everett, San Diego, 11:28.4; 2nd Hal Roth, Berkeley, 9:30.3; 3rd, Joe Bilgri, San Jose, 8:56.8.

In the gas events the following were winners: Class Half-A, Bill Krecek, Glendale, 21:32.8; 2nd, Bob Wiehle, Hollywood, 17:54.6; 3rd, Ronnie Watson, Visalia, 17:19.6. Class A, George Brown, Ivanhoe, 19:54.6; 2nd, Ward Swank, Visalia, 16:12.4; 3rd, Homer Werts, Bakersfield, 15:17. Class B, Bill Landeen, LaCrescento, 22:57.3; 2nd, Elmer Achterberg, Visalia, 18:20.3; 3rd, Fred Bonar, Bakersfield, 14:37.3. Class C Joe Bilgri, San Jose, 16:57.3; 2nd, Jack Oxley, Artesia, 12:41.8; 3rd John Casseria, Visalia, 12:22.6. Sweepstakes winner for the regular free flight gas events was Elmer Achterberg, Visalia. Junior Trophy winner was Clifton

Highman, hailing from Bakersfield.

By way of the Fresno Model News and Editor Ocie Randall, we see headlines reading "Visalia Club Cleans up at Fresno's Semi-annual Free Flight Contest." All they did was win six of the trophies. Elmer Achterberg personally accounted for two firsts and a fifth. Elmer is getting to be the one to look out for at all the meets he attends. His ships, all of original design, show excellent construction, and when the time comes to fly—zoom, they go up and float. He always arrives at a meet with a whole carload of models and they all fly well.

The results: Class Half-A, Elmer Achterberg, 9:05; 2nd, Donnie Watson, Visalia, 5:46; 3rd, John Casella Visalia, 4:28. Class A, Fred Ginder, Fresno, 9:55; 2nd, Ward Swant, Visalia, 6:55; 3rd, Bob Schmidt, Reedley, 6:46. Class B, Larry Menucci, Fresno, 14:07; 2nd, Fred Morgan, Fresno, 10:20; 3rd, Emory Hull, Visalia, 7:36. Class C, Elmer Achterberg, 11:21; 2nd, Martin Martin, Fresno, 8:23; 3rd, Jim Scheidt, Fresno, 6:54. Juniors, Frank Fierentino, 2:51; 2nd, Lee Hopkins, Fresno, 1:47; 3rd, Danny Schmidt, Visalia, 1:18.

The *Fresno Club* holds a yearly high-point contest for their club members with trophies going to the winners in the various classes. At the present time the following are winning: Lee Hopkins is leading the Junior Division with 617 points, Fred Morgan is in front in the Senior class with 880 points, and in the Open class, a real battle to the finish line is taking place with Martin Martin currently leading Jim Scheidt by only 41 points. The next monthly meet will decide this event.

The *San Diego Aeroneers* held a very unique contest recently when the rubber builders challenged the gas flyers to a contest. Considerable enthusiasm was smoked up for the meet, promoting general good fellowship. The gas boys were loaded when the time came for the contest with such able flyers as Lyle Corbly, Class C record holder, Dennie Davis, and National Champ Les Bartlett, just to mention a few. The rubber modelers, headed by A. G. "Red" Everitt and Dick Everett, with Wakefield team member Fudo Takogi, spent many an anxious hour trimming their models. The rubber fellows had a little tough luck when George Kline lost his ship on its first flight, and Everett and Harvey Patton blowing motors in their fuselages, but all in all, it was a fine showing.

The gas fellows turned in a little over 52 minutes for their 15 flights, while the rubber boys did over 48 minutes for 13 flights. Being just a little prejudiced, we can't help but feel that with our best and George Kline getting in his other two flights, rubber would have won.

There was only one five-minute flight in the contest—Ernie Wrisely hooking into a bump on his last try. Everitt had high time with 13:29 for three, his lowest being 3:50 when his ship power-stalled on his second flight. Wrisely had 2nd high time with four of the gas bugs next in line.

The *Aeroneers* also held a monthly gas contest on the same day. We were mighty glad to welcome a few of the Los Angeles area boys down to the meet, and Jack Uxley proved his mettle by winning one of the first places. In Half-A Gas, Nat Antoniola won first with 11:59; 2nd, Jack Oxley, 10:27; 3rd, B. Oxley, 7:11. Class A, Les Bartlett 11:10; 2nd, Steinmetz, 4:35; 3rd, D. Shepard, 2:10. Class B, Bob Ehrhardt,

10:22; 2nd, Larry Boyer, 7:36; 3rd, D. Shepard, 6:09. Class C, Jack Oxley, 12:53; 2nd, Lyle Corbly, 11:13; 3rd Dennie Davis, 10:49.

The *Van Nuys Valley Hawks* contest was held in the middle of a housing project, so events were limited to Half-A Gas, Half-A payload; Rubber and Towline glider. For four-bits you entered all events, if you cared to. The field was about one-half mile square, so a five-minute limit was placed on all flights. Ralph Kahn, with his four-year-old "Floater," won the towline event with two maximums and a good third flight. Rubber was won by Jack Block. We staggered in with places in all events to win sweepstakes.

The 3rd "Northern California Free Flight Council" contest was held under typical California weather. The *Oakland Cloud Dusters* pulled a big surprise by donating additional trophies and medals for the rubber category, wherein one of their own members, Carl Rambo, proceeded to take 1st place and one of the trophies. John Tatone of the *San Francisco Vultures* took high time of the day with 14:15.8 in Class A. The high time Junior Trophy was won by Charles Keyes of San Lorenzo with 13:43.2, which was, incidentally, the second highest time. Bill Maranville of the *Elmhurst Prop Busters* won Half-A with 12:33.8, while Ed Ghiorzce from Antioch, Calif., racked up 10:06 for first in Class B. Hal Simmons, also from the *Elmhurst Prop Busters*, won Class C with 12:48.3.

Sidelights and Highlights all over the West

Several of the West Coast boys are back wearing the uniform of service. Carl Rambo has already gone overseas. Hal Roth is stationed at Hamilton Field, and Carl Randall, 1948 International Champ, is in the Navy. Bill Trumball of the *Aeroneers* is with the Air Force in Okinawa.

Freddie Morgan of Fresno had visions of a nice new trophy on the mantel when he clocked over 8 minutes on his first flight at the Fresno Semi-annual, only to have Larry Menucci nose him out with 3 consistent flights. There have never been prouder parents than Larry's when he got that trophy.

Leo Caton's new Beetle Bomb Class B payload was shattered when a Hogan spiraled into it while Leo was waiting for his second flight at Bakersfield. Needless to say, the Hogan got it too. It was a very discouraging sight since Leo really had a fine ship. "Box"

Wiehle's Wasp-powered Half-A payload is going great guns with a 1st at the *Flying Wheels* meet and 2nd behind Krecek at Bakersfield. A very unusual circumstance was observed at Bakersfield when we noticed two of the wives doing all the chasing. Hal Roth's wife anchored for winding, then chased and retrieved every flight, both days. Where Rog Jensen had a very good excuse, that he had been sick, Hal offered no excuse—and his wife doesn't look as though she needs the exercise!

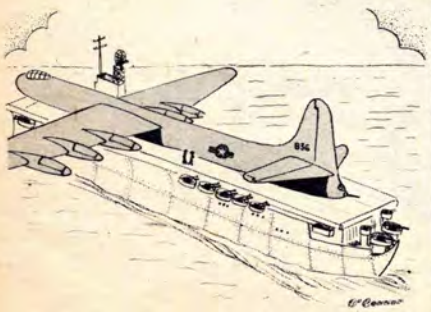
Jim Walker paid a visit to San Diego and spent two days showing off his R-C job and R. O. W. Fireball to Consolidated Vultee Aircraft Co. Jim took off his Fireball, flew it alongside the speedboat and then landed it, much to the amazement of a group of engineers. On Sunday, he put on quite a show for the Camp Pendleton Marines, ably assisted by the *La Mesa Airfoilers*, the *San Diego Airliners*, and the *Aeroneers*.

Larry Goodale flew his twin Torp 32 stunt job. That one flight was really funny. The ship took off with a tight pushrod; Larry thought the weight (5½ lbs.) would be enough to free it up, but it didn't. The ship porpoised through the air with Larry really fighting it while his father, Charley, made several vain attempts to get into the circle and take over. They managed to set the ship down in two pieces, though, just knocking off the nose-gear. Charley won the Beauty event at the Santa Ana contest and is really proud of that plaque.

The recently formed Southern California Model Association has a monthly bulletin out which they call the "Thermal Hook." This lists all coming contests, results of contests, and very interesting personality items such as: "Seems there is quite a private (?) feud raging between Jack Oxley's scarlet Sailplane and Bill Daniel's nine-foot 'Gool.' At last report Jack has been staying just a little bit in front of Bill." . . . The news that Russ Johnson had been named to the Wakefield Committee brought thankful expressions from a large number of the fellows. Russ is quite active and gets along with all the guys. . . . One item stated that Jack Ehlams' new flying scale Focke Wulf 190 is the model of models. Finish like a mirror with every detail, especially the cockpit, being faithfully reproduced.

This S.C.M.A. was formed because of the slow death model building was taking in Southern California. Its purpose is to assist any and all model builders, conduct contests, and last, but not least, to launch a vigorous program to foster the Junior builders.

We sometimes wonder just where all these Junior builders come from. No sooner does the present class graduate



"Darn if I know—must have landed last night in the fog."

than some new ones pop up who seem even better than the others. Bill Trumble, Tommy Moffitt, and Les Bartlett are a few of the present old-timers. Now we see Gary Ball and Bob Ehrhardt who are already winning contests against the older fellows. Not too much praise can be heaped on guys like Dennie Davis and Jim Thompson, who often let their own jobs suffer just to help these fellows.

Eight-year-old Dennis Alford really had it shoved down his throat when they made him fly in the Open Expert Division at the Santa Ana All Stunt Contest. It is beginning to look as though it doesn't do any good to become proficient in stunting. Dennis is really good, though, but we think that this contest was just too much.

The *Alameda Model Engineers* recently elected Chet Haworth, Sr., their new president. Chet took over at the Inaugural Banquet, succeeding Ken Horning. The other new officers are Paul Strebel, Secretary, and George Haberman, Treasurer. This club was organized in 1947 and still boasts quite a few charter members.

The *San Francisco Vultures* were to hold a contest in the Fleishachen Zoological Extension which goes under the club name of "The Goat Patch." The events on schedule were combined A&B and combined C&D in both speed, advanced, and experts groups, Half-A Precision for the open group; Half-A, combined A&B and C&D Proto Speed for open; Class A&B Combat clockwise and counterclockwise. One interesting note on the contest was rigid enforcement of the rule that each contestant's name and AMA number must be permanently fixed to the models entered. Contest Director for this meet was to be M. L. Lloyd.

There have been a lot of drag contests lately at all the meets, between the different Half-A motors. It is getting so good that every time you see a crowd gathered round, you can depend on hearing two motors rise in pitch until a fine screaming wind is heard. The two motors used most are the Wasp and Torp. .049. No one has been able to definitely determine which is best, since one wins as often as the other.

It seems the whole West is organizing. Another new one is the West Coast Radio Control Society. They managed to get Doc Good to the first meeting and the new Society now is able to have, to quote: "A place where the RK 61, Rudder-vator and Rockwoods can get together and pass the coils, condensers, tubes, etc., around and maybe learn something." Teach and be taught, is the idea. Any West Coast radio man who is interested can contact A. Bazurto at 156 Maynard St., San Francisco, California, for further details.

Speaking of Radio Control, E. J. Brown has really been going whole hog on the radio bug. Starting about a year ago "Don," as he is locally known, decided he wanted to build a radio job. To do this he first had to learn radio, so he went to work and developed a good knowledge. He practiced his code faithfully and after three tries now has his call letters. Don is quite a fellow and his latest gadget is really a deal. He has rudder and elevator control from a single channel and one escapement. Of course he cannot get all of the controls at one time, but by fast sequence operation is able to obtain any control position he desires. We will try to explain this fully next month, for it sure looks good.

—DICK EVERETT

Petit Pete

(Continued from page 42)

Plastic filler will clean up any rough spots. To get a good fit above the wing, try this—put Scotch Tape on the wing and use the filler above it. After a day, take off the nose section, carefully remove the tape, and you'll see that you have a good fit. Now finish the hold-down set-up. The grommets prevent screwdriver damage.

The wing must be cut out for the fuel tank. Mount it as close to the engine as

"Well, *now* what?"

you can. Now put on the line guide and paper-cover the rear of the fuselage sides.

In finishing the ship, be sure that it is fuel-proof inside and out. A proofer that won't stop raw fuel can give you a real headache. We know. Our ship is Aeronca Yellow with a black Trim-Film cockpit outline. The number is a decal.

We use a small oil can to fill the tank. Backing off the can from the spout a bit will let her fill in a hurry. Overflow will drain out the exhaust opening. Prime the Cub in the front through the cowl opening. If the engine is hard to start, flip the ship over until it does. Test fly on a still day.

Bill of Materials—Petit Pete

1 pc. 1/16" x 3" x 36" medium, keel, stabilizer. 1 pc. 1/16" x 1" x 7" hard, elevator. 1 pc. 1/16" x 2" x 15" medium, former G. 1 pc. 3/8" x 2" x 24" soft, blocks A, B. 1 pc. 1/4" x 2" x 36" medium, side pieces. 2 pcs. 3/8" x 2" x 15" soft, wing. 1 pc. 1/16" x 6" x 6" plywood, engine mount, landing gear mount, bellcrank mount, etc. 8" pc. 1/16" landing gear wire. 12" pc. 1/32" wire, control rod. 24" pc. lead-out wire. 1 pc. 1" x 2" 1/16" aluminum, bellcrank. Fuel tank. 1 5/8" pc. fuel line. 1 pr. 1 1/8" wheels. Hinge cloth. Sta and thinner. Plastic filler and acetone. 1 tube Ambroid. Trim-Film. Decal numbers. Covering paper.

Passenger

(*Continued from page* 36)

is no name. Occupant's better and that's lousy too."

A&B: "Ditto. Cut out the stalling, Doc. I'm three years old, going on four, and still no name. *Hoo, boo-hoo, hoo. . . .*"

GG: "Oh, gosh. Here, use some tissue—it's not doped. I had no idea the thing meant so much to you boys. Uncle George is sorry. He's been busy with the darned old rules, and writing letters to Pop Robbers, and Walt Billett, and Ray Matthews, and Dennie Davis, and talking on the phone to Russ Nichols, Bill Effinger and Frank Ehling and a lot of others, and designing a trophy for 1951 and—and——. Why didn't you speak up sooner?"

Half-A: "*Who* didn't? *Boo-hoo . . .* You just sit there with the old rules, you don't care about us. I'm hopping a freight to the U. S. Naval Air Station at Dallas and see Captain Nieman. Texas cares—"

A&B: "I'm heading for Washington and see Russ Nichols. And Lt. John Burton, too. *You're* not going to do—"

GG: "Yes, I am boys! In fact, I already have. Been talking to your Uncle Al Lewis, the Editor of Air Trails, and he's promised to help you. Fellows, I'll tell you the truth. The reason you don't have nice, resounding names is that I couldn't think of any that were good enough. So Uncle Al has promised he'll get the readers of Air Trails to help.

"Tell you what to do, boys. Go down to the newsstand—here's a quarter—and get yourself a copy of the March Air Trails. On page 36 read the announcement about a contest to find names for you guys. Hurry, now."

Half-A: "WOW! Excuse me, I mean Half-Wow—"

A&B: "Let yourself go, kid! Anybody that's due to know who he is has got a right to feel big!"

Lift Master

(Continued from page 54)

identical ship which did so well at Dallas. The fuselage has been changed to fit the newly specified dummy, and has been strengthened considerably, especially around the nose. The Nats winner had a rather thick wing, as befitted a load-carrying ship, but later experiments showed that a thin wing gave better overall results, even with the new 3 oz. "pilot." The results are so good, in fact, that Ehling strongly advises against flying the plane without the dethermalizer in operation—he lost his prized prototype model by doing just that! The simple pop-up tail dethermalizer is specified. The tail is held on by two rubber bands, one of which supports a short length of fuse; when the fuse burns through, the rear band breaks, allowing the forward band to lift the surface to an angle of about 45 deg., determined by the length of stop-string fitted. For those who like the more elegant style of DT, the timer could be mounted in the spacious cabin and a piece of music wire run out through the extreme tip of the fuselage to hold the tail down.

Before starting assembly of the test model, we studied the plans (full size, of course) and instructions; all the parts in the kit were quickly accounted for, except for two rather long and oddly shaped pieces of 1/16" sheet balsa. We soon realized that these were for movable ailerons—something of an innovation these days, but strongly recommended by Ehling to get that tight spiral climb (O.K., so the plane *is* "spinning upward") sought by contest flyers.

Fuselage construction was started first. In fact, wing, stab and fuselage were all going at once, for we thumb-tacked the plan to a large piece of Celotex wallboard, and had a regular three-ring building spree underway. The instructions suggest rubbing hard soap over those parts of the plan where glue joints are to be made. Personally, we favor the wax-paper method, but either way your plan will be saved for use another day.

As the many fuselage pieces were cut to build up the framework, we quickly realized the truth of John Zaic's claim that the fuselage was made of specially selected hard stock; a sore "cutting finger" soon verified this. Because of the weight to be carried, it is wise to double-cement the fuselage. In other words, after it is entirely assembled, go over *every* joint and add another layer of cement. The hour or so it takes to do this carefully will be amply repaid on the flying field; if the ship suffers a collision or crash, you'll pick up a fuselage—not a basketful of sticks!

The dummy fits in from the top. Frank swore off underside trapdoors after a certain PAA-Load meet on Long Island, when, with the ship in a tight high-speed turn, he lost two successive occupants out the trapdoor—dropped to a horrible death minus parachutes. This wasn't a Half-A ship, but the lesson stuck, and it isn't as funny as it seems, for even though the occupant survives the fall, your flight is, naturally, disqualified.

Wing construction is conventional, rugged and simple. Plenty of ribs are used in both wing and stab, but this is no hardship as the ribs are all ready-cut. Leading and trailing edge stock is formed and needs little shaping to finish. Both wing and stab have considerable taper, leading to good efficiency and pleasing appearance. The rudder is a simple balsa-sheet job, cemented to the stab.

For covering purposes, the kit includes a new paper recently discovered by Jasco. It is not a wet-strength paper, consequently the model should be covered dry. The paper has been found to be very strong, but though it tightens up beautifully after water-spraying and doping, it doesn't seem to warp the framework a bit. In fact, the final surface has sort of a rubbery feeling when you poke it with a finger. Though our test sample was easily covered with two sheets of paper, three sheets are supplied in the kit, assuring ample for any mistakes the builder might make in cutting (and enough for future repairs, in the unlikely case they are ever needed!). A water-spraying pulled the paper up nicely (though it bulges and puckers horribly when wet), and two coats of dope thinned 50-50 produced a fine finish. Fuel proofer is required, of course, but only around the nose of the fuselage where raw fuel might be spilled.

The sandwich-type firewall includes the landing gear wire, and is large enough to fit any Half-A engine now available. For contest work, only the .049 engines should be fitted, as you need all the pep you can get to pull the heavily loaded ship up.

An eyedropper tank is furnished, as the designer feels it is the simplest, and completely foolproof—you can't forget to set your timer.

As to propellers, the instructions go into considerable detail on the proper selection; you can use 5/3, 5/4, or 6/3, depending upon the flight pattern you require. While the original model was being test-flown, the designers found a single bladed propeller made from a broken 6/3 gave the best results of all.

The instructions include many pointers on actual flying technique that will aid the inexperienced builder to get contest results with the least possible grief. Such tricks as tilting the stab, coordinating model adjustment with prop selection, use of ailerons to prevent spiral dives, and other tricks are fully covered. In fact the instruction sheet and plans both are notable for inclusion of many little ideas gleaned from the long contest careers of both Ehling and Zaic; ideas like "keying" the wing and stab, use of bandage gauze at points of great stress, fitting a wire ring to the wing-holding rubber, *et cetera*, are typical of the products of this concern.

These simple, but not so widely known hints make for sturdy construction and real contest potentiality. We'll watch you fly your Lift Master at the next PAA-Load contest!

Dope Can

(Continued from page 41)

the AF competition. He reports, "The Air Force is taking quite an active interest in model aviation activities, both as an off-duty recreation activity and as an educational activity . . . a letter is at this time being processed through Headquarters advising the commands of both the Zone of the Interior and Overseas of the value and potential that exists in this program."

We understand Lt. Vogler was called to Washington to expound on the value of aeromodeling and did so well he was kept there for 10 days while a lot of

the important brass got the "word." The events lined up for the AF Nats are impressive: four classes of speed, stunt, team speed, jet, flying scale and beauty —all U-control.

The AF'ers would also include rubber events: R.O.G. cabin, stick, flying scale and beauty. Hand-launched and tow-line-launched gliders are on the agenda. In the free flight arena would be found every class from Half-A through D, flying scale (this engine powered), beauty, PAA-Load and PAA Clipper Cargo event.

It all sounds stupendous—in fact, a little too much so. Anyone who has done any modeling in the service, or even attempted any, knows of the great difficulty encountered in storage and transport of models. It would be physically impossible for the average G. I. to handle anything like half of these events. Since the Air Force would be able to have ample personnel for officiating if the meet comes off (that "if" is put in there by the international situation), we wonder why the service doesn't come up with some combined events and put Wright Field to work figuring out the proper method of running such categories.

For instance, why not fly all classes of free flight together? Use a "fudge" factor to multiply the performance of the smaller ships *if* they need it. Why not a combined control line event where the airman flies one plane for speed and stunt and has it judged for beauty and scale points (if any)? Including team racing and jet flying, you'd end up with 3 U-control events, which sounds a lot more reasonable than 9. Ditto for rubber and free flight. Well, we shall see . . .

Pen Pals. Bob Abell, 15, Box 210, Iroquois, Ont., Canada, flies free flight and control line, is a senior in high school, is looking for a U. S. correspondent . . . Fred H. Moystner, 1311 S. 17th St., New Castle, Ind., likes all types of modeling, seeks writing friend 14 or 15. Fred wants to know where he can buy 1/20" basswood planking. Can anybody help him?

Ouch! Looks like that hornet's nest we stirred up on rules and events refuses to cool off. Well, we said every man would get his say. Here's Curtis D. Janke of Sheboygan, Wis.:

"It is quite true that there are too many events at the Nationals. However, the proposals advanced to cut them to a more reasonable number are neither fair nor logical. Not taking into account age groups and events that are either unclassifiable or of doubtful or non-standard classification, at the Dallas Nationals there were sixteen gas-powered events as against four rubber-powered events. In spite of this already-existing four-to-one discrepancy, one of the proposals advanced is to fly only one rubber event indoors and one outdoors. In other words, there are too many gas events, so let's cut down the rubber events!

"In both indoor and outdoor rubber types there are several size categories, with at least as great a performance differential between the sizes as exists among the various gas size groups; but to contest the several sizes of rubber model separately is utterly unheard of, either at the Nationals or at regional meets. The gas types, on the other hand, are not only flown in separate events for each size group, but there is a large and juicy prize list for each.

(*Continued on page* 86)

Showcase

Contact your hobby shop for items shown. All information is checked carefully, but is subject to change.

Back again is the *R.B. Special 29* motor fitted with a glow plug for g.p. operation. Mfgr. says the engine is 100% custom, precision built.

Bore is .750 in.; stroke, .678 in.; displacement, .29 cu. in. Crankshaft is mounted on two ball bearings. Centave Mfg. Co. (15209 Aspinwall Ave., Cleveland 10, Ohio) handles it. Sells for $16.95. . . . Looking for a distinctive gift or an unusual addition to your mantel? The *Lunar Phantom* should fit the bill. It's an 18.5 inch long moon rocket in kit form with solid balsa shaped fuselage and other parts cut to fit, plastic domes, 4-color decals, red and silver paint, metal display stand, full size plans—a real deluxe affair. Sells for $2.49 from Pilot Model Shop (5450 W. Belmont Ave., Chicago). . . . More conventional and making a name for itself in Half-A circles is *Knockout*, a prefabbed stunt model by Enterprise Model Aircraft & Supply Co. (5107 Avenue "D," Brooklyn 3, NY). It features a prefabricated hollow high-lift symmetrical airfoiled wing, round and hexagonal sections in finish carved-shaped fuselage, rubber wheels, formed landing gear, die-cut firewall, balsa parts and colored decals. With an 18 inch wingspan, *Knockout* was designed to take motors from .03 to .099 cu. in. displacement. . . . Calling all free flighters. Lookie what Acme Model Engineering Co. (8120 7th Ave., Brooklyn 20, NY) has come up with: a real "take-off" tank for your free flying gassie. Type "T" in Acme's line, it's used as follows: you hang the tank on the side of your plane until you're ready to release the job, then you remove the tank and the engine runs on the fuel left in the line. You predetermine the motor run by selecting the proper length of tubing to give desired run. Size: ⅞ x 15/16 x ⅝ inches. 50¢ each.

One of the many fine features of an Academy of Model Aeronautics' model flyer's license is the public liability coverage ($50,000 and $100,000 personal injuries; $10,000 property damage). By subscribing to the safety rules of the AMA, you can obtain the license and liability coverage. All licenses are on a calendar year basis, so the sooner you sign up the more you get for your money.

Academy of Model Aeronautics
1025 Conn. Ave., Washington, D. C.

On July 1, '50, I was ..... years old (license classification is based on your age on July 1). Please issue license checked:

Class III—(up to and including 15)..$1 ( )
Class II—(16 through 20).....$1.50 ( )
Class I—(21 years and over).....$2.00 ( )

.....
Name (print)
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Address
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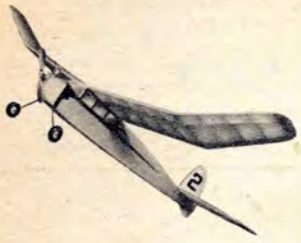
City Zone State
(Sign your name below)

Showcase

Try your favorite hobby shop for items presented here. Write the manufacturer if you can't find it.

You've probably already spotted the new appearance of the Speed-O-Laq "Flight Tested" aircraft dope bottles in your hobby shop, but in the event you didn't we wanted to pass on the word that the entire line of 23 colors now sports a brand-new label which features the word "dope" in big white letters on brown panel surrounded by bright yellow. The name of the color or finish is on a yellow strip. The brand name Speed-O-Laq, together with the winged "Flight Tested" emblem is at the top of the label in red. S-O-L dopes and aircraft cements are manufactured by The Speed-O-Laq Products Co. (St. Paul, Minn.), suppliers to full-scale aircraft field. . . .

That free flight design there is a Henry Struck creation being kitted by Berkeley Models (West Hempstead, LI, NY). It's a Half-A PAA-Load job called *Bootstraps* and features prefabricated construction with die-cut balsa and plywood parts, formed wire gear, hardware and wheels. With a wingspan of 40 inches, it weighs 5 oz. Priced at $2.50. The construction method is called "Auto-semble" and has interlocking parts. . . . In the control line field we call your attention to deBolt Model Eng. Co.'s All American Models and specifically to the *A-A Trainer* for beginners. It was designed to take Cub engines from .049 to .099 cu. inch displacement. Building time is 2 hours, says Harold deBolt. Kit comes ready to assemble with shaped wing parts, fuselage and tail. The job was created to take the knocks of beginners' flying. . . . New way to fly C-D jet models! Experiments by the design dept. of Cleveland Model & Supply Co. (4505 Lorain Ave., Cleveland 2, Ohio) has proven that scale jet models of the type manufactured by concern may be flown far & wide as towline gliders.



Dope Can

(*Continued from page 83*)

Nevertheless, someone proposes to rob the orphan of his rags and cut down the rubber events still more. Not only is this outrageously unfair, it also has an odd odor. It is just barely possible that someone thinks there is more money to be made from gas models than rubber models.

"Now to the main event; the especially vicious attack on my specialty, indoor models, by the character who very wisely masquerades behind a *nom de plume*, the 'Dopester.' Along with a tongue-in-cheek sop to indoor enthusiasts, meant to disarm ('No matter how much we may like to build and watch indoor rubber models') and a rather ridiculous accusation of cultishness, this person expresses an opinion that points awarded to indoor contestants are too easily come by as compared to those in the 'more hotly contested categories.'

"Mentioning in passing that one of his 'more hotly contested categories,' the stunt event, had a registration of 3% as compared to the indoor 6%, I'd like to ask a question: if place points in the indoor events are so easily garnered, what is to prevent a 'crack' yo-yo twirler who, from the awed accents of the 'Dope'—ah, pardon me, 'Dopester'—must be something greater than human, from taking a few moments from his larger concerns and hurriedly tossing together several indoor models that, as a logical result of his vast superiority in all things aerodynamical, would be so far in advance of any now being flown that they would enable him to take several first places from the oh-so-inept indoor cultists with the greatest of ease, and so pick up a few dozen cheap points toward the National Championship that is the issue under debate? Too proud to stoop?

"As for indoor flying being a diminishing field: even if this were true, who is at fault? Apparently one basis for such a statement is the relatively low registration in this event at Dallas. The reason for this apparent lack of enthusiasm is so obvious that I hesitate to explain it; it's an all-too-familiar story to indoor contestants since 1935, but just for the sake of the record, here it is: most of the indoor entrants were not Texans and had had to travel anywhere from six hundred to two thousand miles—for the glorious privilege of flying in an outsize phone booth!

"Proud of the Will Rogers Coliseum though Fort Worth may be, it is hardly an indoor flyer's idea of heaven, and it shouldn't be hard to understand why many of the greatest indoor builders in the country decided to stay at home with their wives and television sets, rather than trek the width of the continent and beat their brains out attempting to fly in a building into which the model boxes had to be carried flatwise in order to keep from scraping the paint from the ceiling!

"And I'd like to point out that, in spite of all this, the indoor registration was just equal to that of the PAA Pay Load event with its three separate size classes, large CASH prizes, and all of the sky of Texas up to the stratosphere for flying space. And this is the very heart of the free-flight gas country, where an indoor model otherwise is almost as rare as a class in sheep-shearing! Indoor flying a diminishing field?—who's kidding who?

"Now for some constructive suggestions, which will be ignored, of course. First, leave the rubber events as they are; they are few enough as of now. Second, cut the free-flight gas to just two events. R.O.G. and hand-launched, with no separate size classes. This is eminently fair, as it will precisely balance the outdoor rubber events. Third, to silence carping concerning points allegedly too easily earned in events with small entries, pro-rate the points awarded according to the number of entries in the event as well as places won in that event.

"To elucidate, the contestant placing in an event with a large entry would earn more points than one winning a similar place in an event with a smaller entry. The Chicago Parks District uses this system and it works well. Too well, in fact; in an indoor meet held there I took two first places and finished out of the running for the grand award because I hadn't placed in the 'more hotly contested' glider event!"

'Ray for Red! As a means of recognition of aviation talent, Harold C. "Red" Reinhardt, 18, of Elizabeth, N. J., was awarded a full scholarship in the Aircraft and In-line Engine Flight Mechanics Course, leading to a Private Pilot License and an Aircraft and Engine Mechanics rating and certification by the CAA by Teterboro, N. J., School of Aeronautics.

Reinhardt, holder of many model airplane awards, won first in stunt at the last Plymouth Internationals. Last November, A. Di Stefano, Teterboro's director, saw Harold interviewed on the "Tex and Jinx" TV show in connection with a modelplane program. During the interview, Harold expressed a desire to be an aviation mechanic and pilot, but because of financial requirements was unable to attend a training school.

Red realized his ambition and the Teterboro school made his dream come true on a later Tex and Jinx program when official presentation of the scholarship award was made.

Club Chatter. *Sacramento, Calif.*— The Capital Screamliners meet the second and fourth Mondays at the N. Sacramento Youth Center. The club has been organized for three years and boasts 64 active members. Officers are Don DeFried, pres.; Chester Colby, v.p.; Jack Ray, sec.; Gerry Ewing, treas.; Gus Johnson, sgt. at arms; and Bill Sproul, who handles publicity. Activities are limited to U-control. This winter Half-A stunt, speed, scale and combat events have been run off.

An interesting sidelight is an affiliate club program. Several of the adult members have started small affiliated clubs in their own neighborhoods. The clubs make and enforce their own rules and collect their own dues, paying only 5¢ per member per month in the Screamliners' treasury. In exchange, affiliate club members receive all the benefits of a regular member in the "mother" club: insurance, recognition of all records in Western Associated Modelers sanctioned meets. The neighborhood clubs are under no obligation to the parent Screamliners; about the only requirement is that their members be under 18, since everyone over 18 joins the parent club. All adults or members of the Screamliners have no voice in the affiliate clubs other than advisory when requested.

Sounds like a swell idea; wouldn't it be fine if lots of other big clubs started programs like that? Thanks, Jack Ray,

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for a grand and interesting report.

Northampton, Mass.—In conjunction with our Kitty Hawk article, the Look Park Aero Club has set up a training program under the direction of Frank Doane to teach fundamentals of free flight to young modelers. Among the models that fit into the program is AT's Cloud Hound along with the Jasco *Senior* and the Monogram *Pirate*. The beginning modeler is supervised from his first model on through the final adjustment and flight of the hardest in the series, then he or she is ready to take off on his or her own.

Boston, Mass.—The Boston Balsa Bees meet every Wednesday night at 135 Federal Ave.. Quincy, according to Myron S. Wolf, 6 Colliston Rd., Brookline 46, Mass., who underlines the statement (and well he might!): "We have our own U-control field in Boston." Organized 7 years ago, the Bees have as their president William O. Ellis; Huey Rainge is treasurer; Joan Powers, secretary; and Mr. W. handles publicity.

Englewood, Calif.—"Ahem!" says Fred Bonfils, corresponding secretary of the Englewood Flying Circus. "This is to inform you that the E.F.C. put on a flying show at the Federal Correctional Institution at Englewood in the early fall of '49. We repeated the show this year for the boys at the institution upon the request of the officials who seem to appreciate the values of hobbies in overcoming many of the problems that had brought the boys to the institution.

"Also the flying Circus put on an air show in early 1950 at the Golden, Colo., School for Boys. As you can see, contrary to your information (on a recent story anent modelers staging exhibition flying within prison walls) our boys here have been putting on shows in correctional institutions for two years."

Swell, Fred—but how come you didn't let us know before now?

Ft. Worth, Texas.—As a true Texan, Leo R. Holliday, 2915 Primrose, Ft. Worth 11, writes for the express purpose of bragging. He wants to tell the world of the accomplishments of the Sahib Club which has held a control line meet the first Sunday of every month since March, 1949. Leo feels that this is some sort of a record in the nation; he knows it is in the Southwest.

A little about the meet itself, described by LRH: "Two of the local hobby shops contribute some money each month and we charge 50¢ entry fee for each event. A beautiful trophy is given away for 1st and a medal for 2nd. In order to hold an event there must be at least 4 contenders. We give a small 4" cup for events with less than 6 entrants, and a large cup for all events with more than 6. This is done so that the winter events will be self-supporting.

"We hold as many events as possible and never know which ones will be included from meet to meet. For example, we started out with only one speed class. This, of course, discouraged the small models. We now have a Class A speed, Class B and combined C&D. We are now trying to separate C and D. Events other than speed which we have held up to this time: C&D Combat, A&B Combat, C&D Stunt; A&B Stunt, Beauty and Team Racing. The club has set up combat and skill flying for its Junior flyers. A public address system is utilized at each meet; this and the trophy expense are paid for by entry fees and donations.

"Competition is very keen here. Our club's record has been outstanding in out-of-town meets. We won every combat event entered except two over a 5-month period. In one meet at Wichita Falls, Texas, the Sahibers took 14 of 26 places. For an idea of the competition encountered at such contests here are some times: D speed, 147.58; B speed, 124; A speed, 109.57. Such flyers as Jim Clem, Dick Swenson and Al Temple are frequest visitors to our meets. Non-Texans who flew speed at the Nationals can respect those times. Another note for those who were at the very wet '50 Nats—you might like to know *it has not rained in Texas for*

ADVERTISERS' INDEX

March, 1951

Academy of Model Aeronautics..... 84
Acme Model Eng. Co..... 66
Aeronautical University..... 75
Airlane Model Co..... 86
A-J Aircraft Co..... 53
All American Model Motor Exchange... 74
America's Hobby Center.....6, 7, 8, 9
Mel Anderson Mfg. Co.....18, 19, 84
Chas. Atlas..... 89
Atwood Mfg..... 81

Berkeley Models, Inc..... 90
Broad Ripple 87

Cal-Aero Technical Institute..... 5
California Flyers..... 13
Centave Mfg. Co..... 67
John E. Clemens..... 78
Cleveland Model & Supply Co..... 72
Comet Model Hobby Craft, Inc..... 71
Consolidated Model Engineering Co.... 73
Corr's Nation Hobby Supply..... 82
Crescent Model Co..... 85
Crosby's Hobby Centre..... 87

Dallas School of Aviation..... 17
Darwin Model Aircraft Co..... 76
Dealers Hobby Supply..... 82
deBolt Model Engineering Co..... 61
Doram Sales Co..... 80
Dumas Products..... 85
Duro-Matic Products Co..... 77
Dyna-Model Products Co..... 78

Edwards' Hobbies..... 80
Embry-Riddle School of Aviation..... 20
Enterprise Model Aircraft & Supply Co. Inc. 64

F & B Model Aircraft..... 67
Fador Mfg. Corp..... 80
Fischer's Hobby Service..... 87
Flo-Torque 83
Forster Brothers..... 60
Tex Foster..... 87
Francisco Laboratories..... 66
Froom Mfg. Co..... 71

Good's Hobby Shop..... 87
Gotham Hobby Corp..... 89
Paul K. Guillow..... 57

H & P Plastic Products Co..... 16
Harley-Davidson Motor Co..... 10
Hay's Hobby House..... 87
Henry Engineering Co..... 85
Herkimer Tool & Model Works, Inc. Back Cover
Highway Hobby House..... 87
Hobby Decal Specialists..... 84
Hobby Exchange Club..... 78
Howie's Hobby House..... 87

Indiana Technical College..... 80

Jamco (Jamaica Co. Hobbies, Inc.).... 87
Junior Aeronautical Supply Co..... 77
Joy Products..... 86

K & B Mfg. Co.....2nd Cover

Margo Kraft Dist., Inc..... 85
Master Modelcraft..... 68
Mercury Model Airplane Co..... 79
Midwest Model Airplane Co..... 81
Miniature Aircraft Corp..... 70
Mod-Ad Agency, Inc..... 6
Model Aircraft Control Co..... 83
Model Craft Hobbies, Ltd..... 79
Monarch Model Co. Inc..... 89
Monogram Models..... 63
Mutual Broadcasting System..... 83

National Model Distributors..... 81
Northeast Hobby Center..... 87
Northeast Hobby Dist..... 86
Northrop Aeronautical Institute..... 15

PDQ Products Co..... 89
Pactra Chemical Co..... 12
Pan American World Airways..... 69
Park Hobby Center..... 87
Parks College of St. Louis University.. 3
Pico Model Co..... 87
Pilot Model Shop..... 79
Polk's Model Craft Hobbies..... 62

Quaker City Hobby Shops, Inc..... 87

Radio Control Headquarters..... 84
Ranger Products Co..... 86

Scientific Model Airplane Co..... 59
Scranton Hobby Center..... 74
Sky Hobby, Inc..... 82
Soaring Society of America.....82
Spartan School of Aeronautics..... 11
Speed-O-Laq Products Co..... 73
Victor Stanzel Co..... 76
Bob Steele Hobby Center..... 87
Step-A-Head Mfg. Co..... 89
Sterling Models..... 75

Testor Chemical Co.....3rd cover, 46, 47
Teterboro School of Aeronautics..... 78
Thomas Products..... 76
Top Flite Models, Inc..... 78
Trost Modelcraft Hobbies..... 82

United States Army and United States Air Force Recruiting Service..... 55

Vic's Hobby Supply..... 87

While every precaution is taken to insure accuracy, we cannot guarantee against the possibility of an occasional change or omission in the preparation of this March, 1951 index.

3 months to the time of writing. Doesn't seem possible, does it?"

Letter from "Over-There." "I was greatly intrigued by your discourse on the '50 Nats," writes Lt. Eric E. Ericson, Hq Sq FEAMCOM, USAF, through the San Francisco armed forces postal service. "Of course, I have been out of competition since '40, but I can well sympathize with you on the panic button pushing that must have reigned at the '50 Nats . . . but the one outstanding feature of my modeling days was that even the smallest of contests such as the old Junior Birdmen had at Central Park (NYC) were a confused mess and we all took it for granted that panic and confusion were inherent features of our racket.

"In conjutating this subject from all angles it is apparent that (1) there are too many people gathered on one spot for the events scheduled, rather than too many events for those poor harried souls who through some stroke of fate cannot enter all events and hence blow verbally one way or the other. (2) As in many other great sporting events, the industry has failed to keep pace with the natural expansion of the modelers—we are running a 1950 Nats on the 1935 basis.

"Let's face another fact—the Nats is not the only nationally recognized annual modeling event in the USA, wherein thousands of modelers come from all states of the union, and thus, in a few short years *we may* have rival camps. Therefore it behooves not the modeler to make the decision, but rather those entrusted with leadership.

"Many potential GREAT modelers do NOT get due recognition all because they do not go to the Nationals, for reasons all too obvious these days, *i.e.*, lack of $$$$. In the spirit of a truly National event, we need playoffs—wherein all get their fair chance to get later National recognition.

"Granted that a smaller contest is run more smoothly, let's propose:

"Based on proportional representation (N.Y.C. legislative system) let there be contests on a regional basis. It amounts to that N. Y., Penna., and N. J. modelers should have a contest to see who is going to the Nationals.

"Of these regional contests there would emerge certain winners. Let us say that the first three in each event would be the representatives at the Nationals, where the winners of all events of the other regional districts would meet to hash out the Grand Prize Winner.

"The lads who were winners at the Regionals would have ample time to scout up a sponsor to send them with all or most expenses paid. It should be the responsibility of the National officials to see that each lad would have a fair chance to attend and would if necessary furnish bed and board.

"Consequently we have our Regionals, and now approach the Nats. With only the winners of the Regies able to compete at the Nats we have the cream of the Region to vie at the Nats for top honors.

"Hence with winners present only, events can be scheduled and run most efficiently for the benefit of all concerned. Then and only then will you have a National that is a National.

"I can actually see a greater lift given to the industry as a whole by a Regional set-up. It would create more fellows trying out for certain fields they normally shy from, and most certainly it beats even a State meet which is usually sponsored by only one club and the business-men of the city in which the competition is being held.

"I expect that if you discuss this proposal with your cronies great cries of pain and anguish will emanate from way down deep, but it is my contention that there is a great void in the organization of this fine sport; we have top-level, and we have bottom-level, but the meat of the thing, the middle substance—this is totally lacking."

Sikorsky

(*Continued from page* 62)

complex traffic pattern of our highly developed urban centers.

"For example, we have developed executive transport service between United Aircraft's Pratt & Whitney plant in East Hartford and our factory here in Bridgeport. We cover the 55 air miles in under thirty minutes, door to door. No vehicle on earth, not even a rocket plane, could match that speed, for most of the time consumed in making the hop in a fixed-wing airplane would be lost going to and from the airport. For mail and express, this system of flying over the city's congestion is much akin to the job of flying over the jungle, and should be the next logical step. This will probably evolve as sort of an aerial taxi service, one run by professional airmen, with high prices in the beginning, coming down as time goes on and as the cost of vehicles and operation is reduced.

"The next step is the helicopter bus, a 20- to 50-place vehicle, used as a form of large-scale rapid transit. The personal helicopter, in my opinion, will arrive last. I see this as a developmental offshoot of the helicopter taxi, and will resemble it as the surface cab resembles the private automobile. However, there are both technical and operational problems to be solved before the personal helicopter will become a reality.

"The time schedule for these events depends, I repeat, on the extent to which our civilization actually needs the particular kind of transportation."

What do you think the helicopter of the future will look like?

Mr. Sikorsky: "Not too much different from our current machines in general outline. I believe that the single rotor type would remain the most important and efficient among the different possible helicopter configurations. I believe that this would be in direct analogy and largely for the same reason which caused the monoplane to emerge as the most prominent type among the fixed-wing aircraft. Indeed, on this subject one should not be too dogmatic, and different kinds of service or other special requirements may, in some cases, suggest the use of different forms and configurations.

"The excessive tip-speed argument which has been used against large rotor disks has not proven valid within the range of practical-sized helicopters. For example, we have a 10-place machine in our H-19 model. A 20-place airplane would not be very much larger, since increasing the capacity of any air vehicle is a job in geometric, not arithmetic increase.

"Those who object to the tail rotor on the grounds that it consumes power have failed to calculate the problem accurately. The tail rotor uses no more power than a fixed tail group, being pulled through the air by main engine power.

"I envision the helicopter bus of the future as having a fuselage much like a DC-3. The main rotor would be above, the two engines in streamlined nacelles outboard of the fuselage. I like this outboard installation, since it isolates the noise and vibration of the engine from the passenger compartment.

"Such aircraft would operate at only 200 or 300 miles range, and would have to be designed for reasonable one-engine-out characteristics.

"In all three classifications of future helicopters, bus, taxi and personal machine, I see two trends in common—trends that were followed in the development of fixed-wing designs. These

are a reduction in power loading and an increase in disk loading. This will result in faster, more stable and generally more efficient machines. The increased horsepower output per pound of engine weight being made available through the development of gas turbines will effectively increase the rate of technical development of the helicopter. As for performance, I see the helicopter-bus cruising at between 175 and 200 mph—any faster cruising speeds are in the province of fixed-wing aircraft, which serve an entirely different purpose in the world transport picture.

"Likewise, the helicab and the helicar will, in my opinion, be simply streamlined refinements of the present single-rotor designs. Main rotor disks are apt to be smaller, but this is likely to be the main visible difference."

What do you envision as the ultimate impact of the helicopter on society?

Mr. Sikorsky: "Every form of fast, flexible transportation has had its effect on the complexion of society. At the present time, our systems of transportation between residential areas and the centers of commerce and industry are notoriously weak. Even the automobile has limitations. For example, here in Connecticut I can buy a 40-acre farm back on a dirt road for the same price as four acres on a paved highway that is kept clear all year round. Both locations are about the same number of road miles from town. However, the larger farm's artery of transportation breaks down about three percent of the time, which takes it out of the commuter-class of property. The development of a form of transportation that could dependably increase the practical commuter radius around any city would have a salutary effect on our whole civilization.

"On a station-to-station basis, commuter trains average under 40 mph. The use of a 120 mph vehicle for the same job would triple the radius, and permit those people who depend on cities for their livelihood to have more living space for themselves and their families.

"The helicab would permit moderate-range transportation within our cities at speeds hitherto deemed impractical for urban transportation. It would permit practical multi-level transportation for our multi-level cities. It would permit the use of outlying sections for offices and stores, instead of concentrating them in closely knotted centers at the crossroads of transportation.

"The effect of the personal helicopter staggers the imagination; it would be more flexible a vehicle than the automobile, and would at least triple the diameter of our daily lives.

"There are, however, numerous problems to be solved before the helicopter millennium arrives. There are practical matters like traffic control, electronics, operational procedure and myriad other problems that have to be solved as they arise.

"As one who has dreamed of a practical helicopter since 1909, I would not like to see its future hampered by unwarranted haste. We have developed the science and the technique of helicopter building to a high degree. We have proven to ourselves that any intelligent technician, applying the known laws and information, can build successful rotating wing aircraft.

"I want to see us all make haste slowly, so that we will be able to fit this vehicle comfortably into the pattern of living for that better world that is surely to be."

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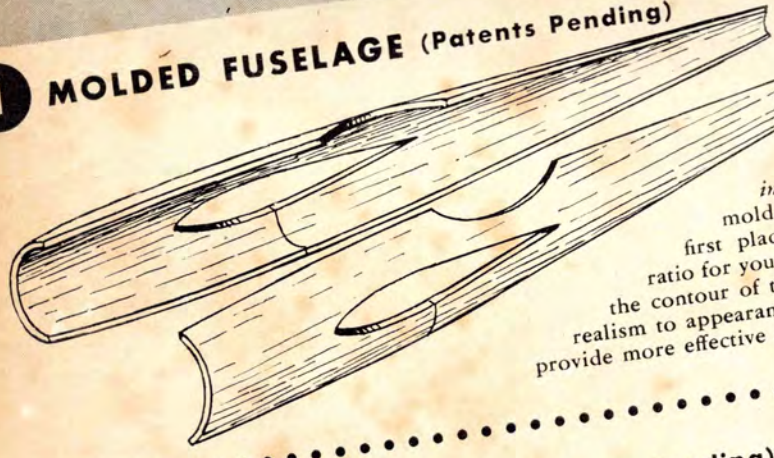

This drawing shows two fuselage half-sections just as you find them in a Testor Senior Kit. *Note that they are actually molded into shape!* The importance of this new and exclusive molding technique cannot be over-emphasized. In the first place, it makes possible a higher strength-to-weight ratio for your model, because the grain of the wood now follows the contour of the fuselage. Furthermore, the molded sections add realism to appearance . . . enable you to obtain a more perfect finish . . . provide more effective structural integration.

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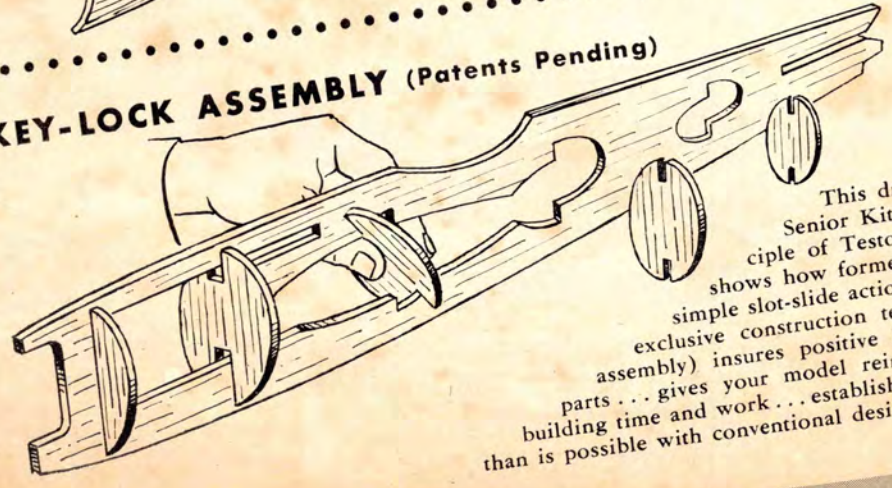

This drawing of keel and formers in a Senior Kit illustrates the construction principle of Testor's new "Key-Lock" assembly . . . shows how formers fit securely into place with the simple slot-slide action of a key turning in a lock. This exclusive construction technique (also used for wing rib assembly) insures positive location and correct alignment of parts . . . gives your model reinforced structural rigidity . . . saves building time and work . . . establishes a higher strength-to-weight ratio than is possible with conventional design.

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